Functional Requirements Document for Joint Total Asset Visibility

July 1997

Contents

1. Description of Functional Capability

The Department of Defense (DoD) logistics and personnel business processes, including those involving joint deployments, require visibility of in-storage, in-process and in-transit assets in the continental United States and all theaters of operation. In certain commodities, where routine dependence on commercial inventories is normal practice, visibility of assets available in the commercial marketplace is needed. Without this visibility, redundant materiel orders, inaccurate personnel accounting, and a general lack of confidence in the dependability of the logistics and personnel pipelines will continue to plague DoD. Numerous examples, including deployment after action reports and various General Accounting Office reports, have been documented that validate the need for such visibility. The *Defense Total Asset Visibility Implementation Plan*, November 1995, further outlines the need for improved visibility of the logistics and personnel pipelines. This initial Functional Requirements Document (FRD) is not intended to further justify the need; rather, it is intended to establish the initial baseline of total asset visibility (TAV) requirements. Consistent with the guidance of *DoD Manual 5000.2*, this FRD will be updated periodically throughout the life of the Joint TAV (JTAV) program.

DoD has long recognized the need for TAV and initiated many individual visibility improvement projects. These current investments in TAV-related projects and the unfulfilled needs for TAV justify development of this initial FRD, which has been developed in lieu of an Operational Requirements Document (ORD). This document represents consolidated requirements taken from the *Defense Total Asset Visibility Implementation Plan*, the Joint Total Asset Visibility (JTAV) "as-is" functional architecture, the joint theater distribution management concept, interviews with potential JTAV users, feedback from rapid prototype fielding, and Military Service reviews provided during global JTAV users conferences.

This FRD supports the goals of *Joint Vision 2010*, prepared by the Chairman, Joint Chiefs of Staff, to leverage opportunities to achieve new levels of warfighting effectiveness. *Joint Vision 2010* emphasizes *focused logistics* — "the fusion of information, logistics and transportation technologies" to provide rapid crisis response, track and shift assets while enroute, and deliver tailored logistics packages and sustainment directly where needed.

The alternatives to establishing a TAV capability are to continue with the status quo or return to an inventory storage approach rather than inventory in motion. The inefficiencies inherent in both of these alternatives are well documented. As a consequence, DoD's future resource constraints preclude choosing either of these alternatives.

1.1 CAPABILITY DEFINED

TAV is the capability to provide timely and accurate information on the location, movement, status, and identity of units, personnel, equipment, and supplies. It also includes the capability to act upon that information to improve the overall performance of DoD's logistics and personnel practices.

As DoD continues to downsize, the need to bring greater efficiency to its logistics and personnel operations increases. TAV has the potential to contribute substantially to achieve greater efficiency by providing materiel managers with the visibility to offset wholesale procurements with excess retail assets; increasing user confidence in logistics and personnel systems, thereby reducing duplicate requisitions; and reducing logistics response time by exposing bottlenecks in supply and transportation systems. With greater deployment and sustainment efficiency, TAV can potentially improve readiness. Thus these benefits will accrue in both peacetime and wartime.

1.2 LOGISTICS AND PERSONNEL ASSETS

Asset visibility encompasses both logistics and personnel assets. TAV addresses the following assets:

◆ *In-storage* — materiel being stored at retail and wholesale inventory organic or commercial sites, and at disposal activities.

◆ *In-process* — materiel being acquired from vendors, but not yet shipped, or being repaired at intermediate- and depot-level organic or commercial maintenance facilities.

◆ *In-transit* — personnel and materiel assets being shipped or moved from origin (such as units, vendors, storage activities, or maintenance facilities) to destination (such as units, storage activities, or maintenance facilities).

◆ *In-theater* — materiel stored, procured, maintained, and shipped and personnel moving within the geographical boundaries of a theater.

Because a requisition is the initial step in obtaining any asset from supply activities, tracking the status of requisitions placed on organic or commercial sources of supply is imperative. While TAV offers numerous benefits during peacetime, its primary value is during wartime and contingency operations.

1.3 ASSET INFORMATION

TAV is not a separate automated information system (AIS). Rather, it is a capability that a family of logistics and personnel systems can provide. Information from those systems, however, needs to be integrated across DoD Components, processes, functional areas, business areas, management levels, and echelons of command. TAV information requirements are not limited to the visibility of materiel and personnel. Visibility of other logistics assets, such as facilities and infrastructure, as well as logistics workloads that affect those assets is also needed.

1.3.1 Databases

The key features of the TAV architecture are the databases of asset information, timely updates to the information, the ability to assess and update that information, and the ability to act on the information. These databases, sometimes referred to as data repositories, are briefly expanded below. They are addressed in more detail in Section 6.

The following information systems are supported by one or more databases. The Logistics Information Processing System (LIPS), inventory control point (ICP) AIS of the Military Services and Defense agencies, and Global Transportation Network (GTN) will contain global asset information. The JTAV in-theater module will contain information only on assets within, coming to, or leaving the theater of operations and will be linked to the Joint Personnel Asset Visibility (JPAV) system that will provide theater personnel visibility. The Global Command and Control System (GCCS) will provide the baseline of requirements for joint operations deployment planning and execution. Each system will provide authorized users a point of entry to its information. As TAV systems become more closely integrated, information from these databases, subject to classified restrictions in GCCS, will be shared and accessed through these systems from a single entry point.

1.3.2 Accessing and Updating TAV Information

DoD organizations and activities need the capability to rapidly access TAV information, conduct ad hoc queries, and automatically update databases with minimal human involvement. Real-time connectivity among databases located throughout the world clearly presents a number of major technical challenges. Data quality, timeliness, and standardization are but a few of the problems that must be overcome during system interface and shared data environment (SHADE) efforts. Expanded use of automatic identification technology (AIT) would improve asset identification data accuracy and facilitate rapid source data entry into AISs that support the TAV information architecture.

Accurate, timely, and complete source data are the key to TAV success. Additional data quality steps may be required to ensure the timeliness, accuracy, and integrity of standard transactions, conventions, and data elements.

1.3.3 Acting on TAV Information

Although the JTAV program appears to emphasize the visibility of assets, the capability to act on TAV information is essential for participants to gain confidence in DoD's processes. For example, a retail item manager with a critical need for an item must have confidence that the wholesale manager filling that need has reliable visibility of retail assets worldwide and is capable of coordinating the release of a particular asset in a responsive and timely manner, regardless of owning Military Service or activity. With visibility of inbound materiel, commanders would be less skeptical of DoD's distribution process and be more capable to project when their units will be ready for combat.

2. Threat

The traditional threats described for weapons platform acquisitions do not apply to this effort. However, the asset visibility capabilities delivered in response to this FRD must satisfy user needs in peacetime and during hostile situations. In hostile situations, TAV capabilities could be threatened by the absence of assured communications, disablement of computer equipment due to battle damage, electromagnetic interference, and other potential conditions that affect the use of computers on the battlefield.

A subtle but real threat to the Department's logistics and personnel business areas is the dwindling DoD budget. In past years, DoD accepted some inefficiencies as part of the cost of doing business. Static inventories, inaccurate personnel requirements, acquisition of new items when the same items were excess elsewhere, and overordering because users lacked confidence in the logistics pipeline are examples of logistics and personnel inefficiencies that are no longer acceptable. DoD must leverage visibility information to offset requirements and manage scarce resources better; otherwise, the risk of logistical and personnel failures could become as lethal on the battlefield as other, more traditional enemy threats.

Weaknesses in current JTAV capabilities may also be considered as threats. See Section 3 for shortcomings of existing capabilities.

3. Shortcomings of Existing Capabilities

3.1 GENERAL

Commanders, logistics and personnel managers, and warfighting commanders-in-chief (CINCs) do not have adequate visibility of critical logistics and personnel support. Vertical visibility between wholesale and retail materiel systems still requires improvements, although some progress has been made. For example, the Defense Logistics Agency (DLA) has redistributed materiel or offset procurements valued at more than $32 million using its in-storage visibility system. However, additional improvements in vertical visibility are needed; significant limitations, depending on the commodity and Military Service, still exist. Horizontal visibility across Military Service logistics systems is almost nonexistent because they are usually focused on specific commodities or business processes. Most of DoD's personnel and logistics systems are "stovepiped" for a particular audience with limited means for access outside the owning Military Service or Defense agency. In addition, DoD has no standard method for providing personnel asset visibility for a deployed joint task force (JTF) that severely hampers visibility during joint deployments. Furthermore, a single, seamless method does not exist to track requisitions and assets from beginning to completion of the materiel and personnel movement processes in joint operations. Confidence in the processes is low, resulting in actions to circumvent established procedures.

DoD has made some progress in developing visibility systems, such as the Logistics On-Line Transaction Reporting System developed by the Defense Automatic Addressing System Center (DAASC), Air Force's Advanced Traceability and Control, Navy's Virtual Master Stock Item Record (VMSIR), Army TAV program, and Global Transportation Network. While these and other programs provide excellent building blocks, a fully integrated view of logistics is not available for warfighting commanders, logistics and personnel planners, and financial programmers. The following subsections describe the consequences of critical TAV shortfalls, while Section 4 provides a detailed discussion of both shortfalls and requirements.

3.2 SIGNIFICANCE OF SHORTCOMINGS

The following subsections review the significance of DoD's visibility shortcomings.

3.2.1 Duplicate Orders

Without TAV, DoD's ability to maximize military readiness is reduced. For instance, during Operation Desert Shield/Storm, the responsiveness of the logistics system was degraded by thousands of duplicate orders because operational units had inadequate visibility over the status of their requisitions, particularly for critical items. An enormous amount of materiel was shipped to the theater, but it was not readily available to the forces because of poor control and visibility of assets in theater. Such problems reduce the readiness of combat forces.

Also during Desert Shield/Storm, operating units frequently did not have visibility of the status of requisitioned materiel. As a result, units were not sure if the supply system had received their requisitions. The lack of confidence in the system resulted in units reordering the same materiel, usually with high-priority designators, that compounded congestion at shipping and receiving facilities, increased DoD's demand on commercial and DoD lift resources, and placed unneeded materiel in the operating theater. An easily accessible capability that provides reliable and current information to track orders (both requisitions and the materiel) from using units to integrated materiel managers (IMMs), vendors, shipping activities, and port operators would instill user confidence in the supply system and eliminate a major cause of redundant orders.

3.2.2 Retail Visibility

At the start of Desert Shield/Storm, the primary sources of materiel for operating units were retail assets owned by accompanying support activities. Because headquarters and operational commanders lacked visibility of many in-storage assets, they expended valuable resources to fill initial unit shortages. As operating units deployed and consumed their retail assets during training and later combat operations, they requisitioned replacement assets from the wholesale system. At that point, information concerning wholesale in-storage, in-process, and in-transit assets became critical to sustaining the high operating tempos of the combat plan.

Neither retail nor wholesale supply activities routinely have information about all available DoD assets when filling customer requests for materiel and when procuring or repairing materiel assets. During Desert Shield/Storm, DLA demonstrated one of the principal benefits of asset visibility. Under normal conditions, DLA has visibility only of its wholesale assets. However, during the Persian Gulf crisis, the Military Services allowed DLA, on an exception basis, to use their systems to gain visibility of some DLA-managed assets at retail levels. Those retail assets are not normally visible to DLA ICP managers. The actions enabled DLA to use Military Service retail assets to fill thousands of high-priority, backordered requisitions from deployed combat units.

This benefit, however, does not apply only during wartime. During peacetime, numerous demands from retail customers are passed to the wholesale system even though nearby retail activities of other Military Services may have available stocks for those same items. Weapon system readiness routinely suffers because demands for critical replacement parts are backlogged pending receipt from procurement, while assets are readily available at nearby retail sites of another Military Service (or in some cases, the same Military Service).

3.2.3 Procurement and Repair Decisions

DoD's supply system consists of a series of inventory echelons that satisfy the demands of various customers. Each echelon generally makes order and repair decisions based on the status of its assets with little consideration for the availability of assets in other Military Services. This practice frequently results in excess inventory levels because IMMs may direct the procurement of new assets, when a large quantity of unreported retail excess assets exists in other parts of the system. This practice also results in unneeded maintenance actions when IMMs direct the repair of unserviceable assets, while unreported retail serviceable excesses are available elsewhere.

IMMs do not have retail-level information to offset buy quantities with retail excess assets and, depending on the extent of those assets, delay buys or reduce their repair orders. In addition, military planners do not have vertical and lateral visibility of assets in procurement and repair needed to identify critical shortages and expedite repair and production efforts.

Limited visibility of assets between and across echelons of supply makes it very difficult for theater commanders to know if they have the assets to carry out planned operations. It also inhibits military planners in assessing the ability of forces to conduct operations as part of a major regional contingency or relief effort. During Desert Shield/Storm, for example, a lack of visibility of assets en route to repair, in repair, being returned from repair, and in production frustrated DoD's efforts to expedite those assets for use by support and combat forces. Increased armor plating for the M1A1 Abrams tank and conversion of Patriot I to Patriot II missile systems are just two of these examples. To compensate for this shortcoming, numerous off-line, manpower-intensive actions were required to provide the needed visibility.

3.2.4 In-transit Visibility

In every major deployment during the 20th century, DoD has been plagued by a lack of visibility over cargo and personnel moving to and from the theater of operations. During Desert Shield/Storm, the movement of forces was hampered by the lack of visibility over personnel moving into, within, and out of the area of operations. Visibility over the movement and care of patients being evacuated

from the theater was also insufficient — 60 percent ended up at wrong destinations. DoD also lacked timely movement status information needed on deploying unit and nonunit cargo and personnel.

As a result of that lack of visibility or untimely information, DoD had difficulty identifying and setting priorities, determining assets in the transportation pipeline, and moving materiel from ports of debarkation (PODs). The amount of inbound materiel and the absence of advance information severely taxed facilities, personnel, and lift capability, and resulted in extensive manual operations to identify and transship critical materiel, which delayed combat readiness.

During Desert Shield/Storm, more than 20,000 containers of military materiel (out of a total of 40,000) arrived in Saudi Arabia with little or no documentation. They had to be opened, inventoried, resealed, and then reinserted into the transportation system because military personnel in the theater did not know their contents and the ultimate consignees. As a result, receipt processing times increased significantly. These delays in receiving, moving, and controlling resupply materiel contributed to critical shortages.

In addition, cargo receiving and processing facilities in the theater were overwhelmed with incoming materiel. The absence of consistent visibility of line-item materiel in shipment containers contributed to backlogs at aerial and water ports, difficulties in prioritizing the backlogs, and inefficiencies in intra-theater movements.

These shortcomings in logistics operations will continue until DoD implements a comprehensive TAV capability that is linked to a worldwide in-transit visibility (ITV) capability. Once implemented, ITV would eliminate these shortcomings during both wartime and peacetime and improve the productivity of transportation resources. A TAV capability that includes AIT would significantly improve DoD's ability to rapidly and accurately obtain location and movement status of assets that are in-transit or in-storage.

3.2.5 Personnel Visibility

Theater commanders, supporting CINCs, and home stations for deployed personnel do not have visibility over personnel skills, deployments, and movements from or within the theater during redeployments. Theater commanders have marginal force-tracking capabilities and no capability to systematically keep track of individual movements to, within, and from a theater. Supported CINCs and home station commanders also lack the capability to monitor redeployments for the purpose of home station reception and keeping families of deployed members informed. The effects of this lack of visibility include confusion at all levels, congressional intervention on behalf of concerned families, unexpected receptions upon return to the home station, and an inability to accurately project and schedule passenger lift assets.

3.2.6 Requisition Tracking Limitations

The capability of DoD Components to track a requisition through its life cycle is limited. Significant shortcomings exist in the use of Military Standard Requisitioning and Issue Procedures (MILSTRIP) as a requisition tracking mechanism.

Since all wholesale requisitions submitted to IMMs do not go through the Defense Automatic Addressing Systems (DAAS), LIPS does not have the information necessary to provide the desired visibility over the status of requisitions. Redistributions not directed by IMMs also do not flow through DAAS. Without information on these redistributions, IMMs have incomplete information on demands to assess actual requirements. In addition, before requisitions are sent to sources of supply, they are processed locally. Since LIPS has no visibility over that processing, it cannot respond accurately to inquiries about the status of those requisitions.

The ability to track requisitions may be further limited by new acquisition processes, such as the International Merchant Purchase Authorization Card, which is being used to purchase products and services from commercial sources. Other new processes that use electronic data interchange (EDI) and "electronic mall" programs as well as proprietary forms of electronic commerce, such as the Direct Vendor Procurement Process, Subsistence Prime Vendor Initiative (SPVI), and Medical Prime Vendor (MPV), are not translated into demands and added to the total DoD demand requirements.

3.3 KEY ASSET VISIBILITY ISSUES

The following list of shortfalls only highlight key areas where TAV is urgently needed. More specific shortfalls, linked to requirements, are included in Section 4.

3.3.1 Personnel and Pay Systems

Deficiencies in military personnel and pay systems occurred during and after Desert Shield/Storm. Efforts to resolve those deficiencies were hampered by funding constraints, a lack of core standard data elements, stovepiped functional requirements, incompatible hardware and software, and congressionally mandated systems. As a result, many DoD Component military personnel systems are capable of supporting only specific policies and business practices. Because each Component has systems with unique data elements, DoD does not have a standard method for providing personnel asset visibility for a deployed JTF. In addition, a single-source data repository capable of satisfying the needs of the CINCs and the Office of the Secretary of Defense (OSD) does not exist. Since OSD requirements are not fully met by any Component system, adoption of an existing system for all Military Services is not viable.

3.3.2 Medical Visibility

Theater commanders and medical staffs do not have the capability to monitor critical blood shipments, track patient movements and accompanying patient movement items, and monitor the availability and utilization of medical facilities. The consequences of not having this visibility include timely blood shipments may not arrive in proper condition, blood transportation assets may not be available at ports of entry to move blood where it is needed, commanders may not be able to determine where unit personnel have been evacuated, and the medical workload may be unevenly distributed among available facilities.

3.3.3 Visibility of Reparables

DoD needs a better capability of providing visibility of common-use reparable assets. Primary inventory control activities (PICAs) need visibility of the stocks of secondary inventory control activities (SICAs) and vice versa. A recent DoD Inspector General audit identified approximately $500 million of assets in SICA inventories that were not visible to the PICAs.

Inter-Service visibility of DoD assets is required both horizontally and vertically. The details required include identification of the owning Service, location, quantities on hand, reorder points, requisition computations, and condition codes. This capability would result in the ability of the IMM to laterally redistribute retail assets to satisfy backorders and allow the return of excess assets from DoD activities for offsetting procurement and repair quantities.

A lateral redistribution capability would reduce backorders and excess inventories. Procurement offset results from the continuous identification of excess stock across the Military Services at all levels of inventory. Since fewer backorders are created through more efficient use of available stock, procurement quantities will decrease. This capability will automatically generate the return of excess assets to the wholesale level before the generation of recommended buy quantities. Providing the IMMs the complete visibility of DoD assets will result in enhanced readiness, a reduction of inventory quantities, improved identification and utilization of excess stock, and improved procurement and repair efficiency.

3.3.4 Visibility of Retail Consumable Stocks

The visibility that DLA item managers (IMs) have over retail consumable stocks owned and maintained by the Military Services is limited. Not all retail supply activities of the Military Services provide consumable asset visibility to DLA. For example, DLA has visibility of the consumable assets at only six Air Force retail sites.

The effect of this gap is that it limits where DLA can send materiel release orders. In addition, for some retail sites that do provide asset visibility, not all of their consumable assets are included. Some assets are "off record." For example, not all Navy consumable assets are linked to VMSIR, which provides the Navy's consumable asset balance to DLA's Standard Automated Materiel Management System. DLA requires full visibility of the consumable asset posture of the Military Services' retail locations to support DLA backorders that result from requisitions and to offset DLA procurements with available retail assets.

3.3.5 On-Line, Near-Real-Time Visibility of Consumable and Reparable Assets

Requisitions for consumable assets are satisfied first from Military Service's and DLA's wholesale stocks. Only if wholesale sources are exhausted and a backorder is established does an IMM examine retail assets to satisfy a requisition. DLA and Service IMMs also need near-real-time visibility of retail consumable assets to offset procurements. To satisfy requisitions and offset procurements, visibility provided by periodic inquiries is not sufficient. An on-line visibility capability would correct limitations of current systems with status up to 60 days old.

In addition, the timeliness of completing a lateral redistribution is limited by the transactional process involved. Before IMMs can determine where to issue a materiel release order, they must query retail locations on the asset's balance, and retail locations must provide a response. This iterative, transactional process is inefficient, prolongs logistics response times, and may adversely affect readiness.

3.3.6 Visibility of Disposal Activities

Assets located at a Defense Reutilization and Marketing Office (DRMO) are also in-storage assets. The Interrogation Requirements Information System (IRIS) is the Defense Logistics Agency's system to provide worldwide visibility of assets at DRMOs. It is an on-line inquiry system that allows a user to obtain asset information for a selected national stock number. IRIS is available to all IMMs and is used by all DLA ICPs and most Service ICPs. However, not all materiel management activities have a full automated link to IRIS; some use off-line and manual procedures. In addition, asset visibility information needs to be expanded to provide condition codes.

3.3.7 DoD Shipments Outside Military Standard Transportation and Movement Procedures

Most DoD automated transportation systems capable of providing ITV data to GTN use Military Standard Transportation and Movement Procedures (MILSTAMP) for export shipments and American National Standards Institute (ANSI) X12 government bill of lading (GBL) formats for domestic shipments as

the structure for defining and tracking shipment units. Shipments made outside of MILSTAMP formats and ANSI X12 GBL formats are usually not tracked or documented in the primary feeder systems that GTN and TAV users will depend on.

DoD shipments are often made on the basis of "free-on-board destination"(FOB destination) or under shipment terms that effectively equate to the same arrangement. In such cases, the item vendor or commercial transportation agent arranges transportation to a specified government destination using a variety of commercial shipment documentation procedures without regard to the documentation standards specified in MILSTAMP. Furthermore, when acquisition terms specify FOB destination, the title to an item is not given to the government until the item reaches the specified destination. In-transit visibility is rarely available on these shipments. Examples of these types of shipments are all bulk fuels shipments, DLA's Prime Vendor programs, approximately 28 contractor logistics support (CLS) programs for logistics support of major weapon systems, and any contract where the terms of delivery specify FOB destination.

3.3.8 In-Theater Movement and Visibility

The only standard theater-wide transportation system is the Department of Army Movements Management System – Redesign. This system (1) is not available in every theater, (2) requires transportation force structure for its operation that does not exist in every theater, and (3) does not meet several key functional requirements that are needed for adequate theater in-transit visibility.

The Army has piloted several programs to test technical solutions intended to solve ITV within theater using AIT. However, without a sound theater automated information system, communications, and infrastructure, these projects have achieved only limited success and have been labor intensive in the area of data entry.

3.3.9 Push-Pull Logistics

A "push" logistical support system almost always creates visibility chaos. When DoD activities order materiel from their supporting retail supply activities, a requisition "due in" transaction establishes an audit trail in wholesale and retail supply systems. The audit trail can be used to provide status and visibility of materiel on order. However, during contingencies, massive amounts of materiel are often "pushed" into a theater of operation without a definable user or identifiable audit trail. In these cases, the theater retail systems cannot "see" what is in the pipeline. Consequently a new demand, using a high-priority designator, may be placed on the wholesale system for the same items on the way.

To resolve this push versus pull dilemma, a capability must be designed to compare all theater requests with a database of pushed materiel in the pipeline and

materiel that may be available from theater war reserve stock (WRS). Procedures must be adopted to allow cross-Service visibility and requisition capabilities, and financial follow-up. If a demand cannot be supported from the materiel being pushed into theater or WRS, the demand should then be sent to the wholesale system. Because of the large number of orders and compressed logistics response time requirements, the timeliness of asset availability research is critical. Supporting supply activities must have up-to-date information and the capability to instantaneously determine which assets are available to satisfy requirements.

3.3.10 Multiple Business Practices for Same Functions

Achieving TAV is dependent on capturing information as it is exchanged in common business processes. However, many DoD business processes are conducted differently depending on commodity, theater, and peacetime (versus contingency) operations. With so many variables that change due to the situation and location, it is difficult to achieve TAV data consistency and reliability on a worldwide basis.

Although most Military Services have a long-term goal of doing the same in peacetime as they expect to do in war, actual practices reflect that many peacetime processes are based on economics, not worldwide applicability. DoD activities do not consistently perform the same business processes and use the same automated systems in both peacetime and wartime. In many cases, CONUS practices have been molded around economic practices that are difficult if not impossible to extend worldwide.

Moreover, even in peacetime, each theater may perform logistics processes different from another. Examples are the peacetime and wartime food service business processes, ammunition systems that resort to manual operations during wartime, and push versus pull logistics. Also included as part of this issue is the employment of commercial express transportation services in peacetime. Assets moving via these services are often channeled into more conventional DoD transportation services to deliver them to contingency areas of operation.

3.3.11 Alternative Product Identification Techniques

DoD activities continue to implement business practice improvements, such as prime vendor just-in-time distribution, for day-to-day supply support. In doing so, they are also becoming more reliant on commercial product numbering systems such as the universal product code (UPC), universal product number (UPN), national drug code (NDC), and vendor catalog item number (VCIN). In some cases, these numbering systems are commodity specific, such as UPN and NDC for medical and VCIN for subsistence items.

UPCs, in contrast, cover a wide range of supply items. Although these numbering systems are all product specific, they do not conform to the national stock number

(NSN) military standards (MIL-STDs) and are not accommodated in DoD legacy systems. On the other hand, when used in accordance with industry standards, they provide efficient access to the marketplace, adjust to market changes, and are preferred by suppliers. NSNs identify only a small portion of available products and, in the case of medical items, only 10 percent of the 1 million different products.

Materiel management AISs must accommodate commercial product-numbering systems and businesses practices to achieve TAV or materiel management activities must revert to the MIL-STD numbering system and process during the transition from peacetime to contingency and wartime support.

3.3.12 Multinational Logistics Support

The increasing "globalization" of business has a direct effect on Defense activities and the implementation of TAV. Many U.S. manufacturers, suppliers, and vendors doing business with DoD are active in the international marketplace. Often they link their worldwide pursuits to foreign companies in joint ventures, partnerships, and other business relationships. Particularly prevalent is their reliance on foreign distributors, whereby a purchase order placed by an overseas DoD element with a U.S. firm in CONUS may be filled by an overseas element of that firm. Such relationships increase the U.S. company's ability to provide responsive product or service support to all of its overseas customers, including DoD.

Similarly, our nation's forward presence and membership in a variety of bilateral and multinational defense and security alliances results in deployed U.S. forces receiving varying degrees of logistics, operational, and communications support from commercial enterprises overseas and through the provisions of government-to-government host nation support (HNS) agreements and status of forces agreements. An example is the petroleum, oils, and lubricants (POL) supplied at no cost to U.S. forces by coalition members during the Persian Gulf War.

While increasing efficiency and responsiveness and reducing logistics costs, such reliance on foreign vendors and host nation support amplifies the already challenging TAV process. Nonstandard document, shipment, and transportation identifiers; potentially incompatible communications links; and unfamiliar business processes combine to inhibit worldwide TAV capability in the near term. In short, although some progress is being made regarding TAV links with commercial vendors in CONUS, DoD has little to no control over its foreign vendors or distributors.

3.3.13 Data Quality and Timeliness

The success of TAV will depend on exchanging information electronically without constant human manipulation. DoD has a well-recognized and long-standing problem with data quality, timeliness, and documentation compliance. Data quality improvement programs have, to a large extent, resulted in data rejection rates that are unmanageable. Accurate source data is essential.

In a different but related issue, the "age" of data creates a TAV problem. Many DoD systems can, at best, only tell when a file might have been last updated, but almost none of them can identify when data in a particular data field was placed there. Old data create inconsistencies between databases, erroneously updated data fields, and inaccurate reporting. Only recently has date-time stamping, whole file replacement and data field "argument tables" been built into some of the modern AISs to reduce the effect of aged data.

3.4 SUMMARY

No integrated capability exists that allows consumer or logistics operational units, logistics and personnel managers, or deployment managers to gain an integrated view of all DoD and host nation support available to support or offset peacetime or wartime requirements. The two topics, shortcomings and requirements, will be presented in Section 4.

4. Capabilities Required

Achieving TAV is an enormous undertaking, one that requires new capabilities to be acquired through policy changes, procedural changes, automated system changes, and potentially new systems development projects. TAV requirements are generally addressed in these areas: requisition tracking, visibility of in-storage or in-process assets, visibility of in-transit assets, and logistics and personnel management within a theater of operations. The CINCs have different visibility concerns and needs from those of Service logistics and personnel managers, and their normal peacetime management processes. Contingency deployment events create their own set of visibility requirements as well as an expanded customer base that includes the supported and supporting CINCs. This section presents the requirements of both the business process manager and the warfighter.

Required capabilities of the JTAV program are divided into two major sections. Section 4.2, JTAV General Requirements, contains Military Service and DoD agency's business requirements for asset visibility to manage resources efficiently. These requirements exist in both peacetime and during contingencies, including actions such as a force deployment. Within logistics management, this view is sometimes labeled "the wholesale view," but it includes both wholesale and retail requirements with an orientation more toward routine business processes.

The second set of requirements is presented in Section 4.3, Theater TAV Requirements. These requirements are viewed primarily from the theater perspective during crisis actions. The basis for these requirements are taken from interviews, studies and conferences where CINCs and their respective Service components have delineated their TAV requirements relative to the phases of the joint deployment process. These requirements are broken down into the phases of the deployment process: predeployment, deployment, employment, and redeployment.

Prior to a deployment, CINCs need asset and readiness information to evaluate various course of action (COA) alternatives. Once deployments are ordered, unit and nonunit assets are identified and shipped using DoD logistics and personnel business processes. As forces arrive within a theater, a steady stream of sustaining materiel must flow through the logistics pipeline with sufficient TAV to allow theater commanders to alter the flow based on the developing crisis. Last, when the crisis has drawn to a conclusion, a formidable task faces both CONUS and theater logisticians and personnel managers in identifying what assets must be moved from the theater, where they must be returned, and how the redeployment process will be managed.

4.1 USERS OF JTAV CAPABILITIES

JTAV must support the asset visibility needs of all users or customers, both inside and outside a theater. For purposes of brevity, many of the following requirements refer to the terms "JTAV customers" or "JTAV users." In the context of this document, these terms are used to include supply activities down to the direct supply support activity that interfaces with the consuming customer; transportation operational activities; maintenance support activities at all levels; inventory managers; logistics and personnel planners and staffs at the DoD, Military Service, and Defense agency headquarters; Service logistics commands; logistics and personnel staffs of CINCs, JTFs, and their Service components; and the Joint Planning and Execution Community (JPEC) involved with deployment planning, execution, employment, and redeployment.

Data access is the primary goal of JTAV. The JTAV effort is not intended to create custom-made, special information systems for customers to achieve total asset visibility. The intent of the JTAV effort is first and foremost to provide a means whereby a customer can gain access to information. The term "JTAV information" is not synonymous with problem solving. A secondary purpose of the JTAV effort is to identify the need for a baseline set of models and tools that must be applied or developed to enable customers to use TAV information. Other DoD automation initiatives, such as the Logistics Anchor Desk or Medical Anchor Desk, will use JTAV information to analyze, monitor, and model logistics and personnel status, and solve problems. Models and tools required, and specific methods for giving users access to those tools, have not yet been fully determined.

4.2 JTAV GENERAL REQUIREMENTS

Wholesale and retail TAV requirements are primarily associated with logistics management responsibilities of the Services as they equip, train and maintain the force. These requirements are more closely focused on the business needs of logistics managers. These visibility requirements are valuable to offset or determine worldwide requirements. These needs are primarily driven by the management objectives to gain an economic efficiency and to avoid unnecessary investment outlays.

The status of an asset falls into one of these categories: in-process, in-storage, or in-transit. The terms "on order" and "in-theater" are also used to address TAV term quoted in previous sentence requirements. However, "on order" relates to the status of requisitions for assets in-storage, in-process, or in-transit. (For example, if the asset is available, the source of supply processes the requisition and prepares the in-storage asset for shipment.) While a requisition is not an asset itself, visibility of its status during supply processing and transportation shipping is important information; therefore, requisition visibility is an important TAV capability.

In-process, in-storage, and in-transit assets can be in CONUS or OCONUS; therefore, TAV requirements in Section 4.2 are only assessed by general in-process, in-storage, and in-transit requirements without considering unique theater requirements. Specific TAV requirements from the theater perspective are presented in Section 4.3.

4.2.1 Materiel Management AISs

The AIS of each ICP provides visibility of assets that are in-storage or in-process. Those AISs have always reflected wholesale assets and requirements, but under the TAV concept they would also maintain current data on retail assets and requirements. This visibility is required to include those inventories down to the following levels:

◆ *Army* — direct support authorized stockage lists

◆ *Navy* — shipboard and major shore stations

◆ *Air Force* — base supply and medical logistics

◆ *Marine Corps* — installation supply and Marine expeditionary force (MEF) support activities.

The ICP AIS (a generic term for all ICP AISs that refers primarily to ICP legacy systems and the emerging applications in the Materiel Management System, or MMS, but also includes AISs used to manage specialized commodities such as subsistence, bulk fuels, and ammunition) is required to have visibility of assets in depot- and intermediate-level repair facilities, assets in production at both organic and commercial facilities, and assets held by the Defense Reutilization and Marketing Service (DRMS). Retail supply activities, depot-level repair facilities, wholesale distribution depots, and DRMS are required to transmit data to the ICP AIS to ensure it contains current asset and requirements data.

In addition to ICP visibility of assets, retail AISs are required to have full visibility of assets in-storage and in-process at the ICP level. Retail managers need that information to make effective requisition and cross-leveling decisions. (See 4.2.4.3 for retail-level TAV requirements.)

DoD's materiel management AISs for assets in-storage and in-process lack standardization in data elements, transaction formats for electronic exchanges of information, file transfer protocols, and relational databases having structured query language (SQL) capabilities. DoD requires standard data elements, transaction formats, file transfer protocols, and databases having SQL capabilities.

All new and emerging AISs, including the MMS applications, Ammunition Management Standard System (AMSS), Defense Medical Logistics Standard Support

(DMLSS) System, and Fuels Automated System (FAS), must be fully capable of supporting the TAV operating concept. The functional requirements for MMS, AMSS, DMLSS, FAS, and other new logistics AISs must include requirements for sharing asset visibility.

4.2.2 Requisition Tracking

Requirements for requisition tracking include MILSTRIP requisitions and direct vendor orders via EDI using existing requirements contracts. Requisition visibility includes visibility of the ordered item whether it is in-storage, in-process, or in-transit. Visibility of requisitions is a fundamental requirement of TAV. The following subsections outline shortcomings and requirements for requisition tracking.

4.2.2.1 EXISTING SHORTCOMINGS

Supply sources are required by MILSTRIP to provide information on the status of requisitions. That information includes an exception supply status (such as backordered); a 100 percent or positive supply status (such as being processed for release and shipment); a rejection status (such as unable to process because of errors in quantity, date, or serial number fields); a direct delivery notice; or a shipment status (such as the date released to a carrier). Although MILSTRIP provides this information, its status reporting has several shortcomings as a requisition tracking mechanism:

◆ Status information is not real-time. DoD's wholesale and retail systems use batch processing cycles to generate the status documents.

◆ Because of DoD's batch processing environment, it can take 2 to 5 days after an ICP receives a requisition before an end-user receives any supply status information.

◆ Status information may not reach the appropriate supply support activity. This shortcoming may not be totally attributable to the MILSTRIP process. The inability to obtain status information could also be the result of customer connectivity problems due to an activity's movement in a contingency operation, Service systems that consolidate requisition data and then terminate the MILSTRIP status information, and other non-MILSTRIP procedural issues. The end result, however, is that MILSTRIP status transactions are not sufficient to track requisitions.

4-4

4.2.2.2 REQUIREMENTS FOR TRACKING REQUISITIONS

DoD's requirements for tracking requisitions include the following.

End-users require visibility of delivery quantities and expected delivery dates of all materiel in-transit to prevent submitting duplicate requisitions. Requisition information should be made available to ordering units, where the status of individual requisitions is most important.

Retail supply activities and other requisitioning organizations require visibility of outstanding requisitions so they can respond to end-user queries on the expected availability of all assets on order, determine if alternative actions need to be initiated to fulfill current materiel requirements, and plan receipt workloads. In this application, visibility includes current status of requisitions (such as awaiting processing, being processed, accepted and being processed, or rejected or canceled); delivery quantities and dates; acknowledgments of modifications and cancellations; and current status of materiel in-transit to fulfill requisitions.

Headquarters and major commands require visibility (current status of requisitions, delivery quantities and dates, or materiel in-transit to fulfill requisitions) of outstanding requisitions to monitor the status of critical orders.

CINC and JTF planning staffs require visibility (current status of requisitions, delivery quantities and dates, or materiel in-transit to fulfill requisitions) of outstanding requisitions to assess contingency operations and prepare operational plans. Also see paragraphs 4.3.3.4, 4.3.5.2.3, and 4.3.6.2.5.

Intermediate- and depot-level repair activities require visibility (current status of requisitions, delivery quantities and dates, or materiel in-transit to fulfill requisitions) of on-order materiel needed for repair to schedule workload and status of repair actions that are awaiting parts.

Logistics managers throughout the supply system require the capability to track requisitions for purposes of capturing logistics performance data. These data should include raw performance measures as well as key statistics such as means, variances, and supply chain responsiveness.

4.2.3 In-process

In-process assets are items in repair or procurement. They include items that are in repair at depot-level repair organizations, both organic and commercial; in repair at intermediate-level repair organizations; or on order from DoD vendors and not yet shipped. These assets are categorized as either "due in from maintenance" or "due in from procurement" in DoD inventory management systems.

4.2.3.1 EXISTING SHORTCOMINGS

Logistics managers currently only have limited visibility over assets in the process of being procured or repaired. Usually, unless the IM initiated or is substantially involved in a procurement or maintenance action, there is little visibility of assets in-process that could potentially be considered as offsets to Service requirements. It is rare when an IM of one Service has the capability of "seeing" the in-process assets of all Services and agencies to offset procurements, join a specific procurement underway, or take advantage of another Service's excess maintenance capacity.

Visibility of items being repaired should begin with the turn in of an unserviceable asset to supply for repair at either an intermediate- or depot-level maintenance facility, and end when the repaired asset is shipped to a customer or placed in storage. For items being procured, visibility should begin when an IM prepares a request to procure an asset and end when a DoD representative inspects and issues a receipt for the ordered asset. TAV requirements for each of these in-process components are addressed separately below.

4.2.3.2 MAINTENANCE REQUIREMENTS

OSD requires visibility over broad categories of in-repair assets to monitor logistics system performance; support major industrial mobilization decisions; and evaluate policy, budget, and procurement alternatives.

The Joint Staff requires aggregate visibility to resolve logistics bottlenecks affecting CINCs' requirements, identify critical assets and logistics support priorities for CINCs, and support deliberate planning and allocation of logistics resources. See Section 4.3.

Military Service headquarters require aggregate visibility to support deployment and sustainment operations; monitor status and location of critical, Service-owned assets; and support Military Service policy, budget, and procurement decisions.

ICPs and IMMs require detailed visibility of assets at depot- and intermediate-level maintenance organizations to fill customer orders, monitor and provide accurate status and delivery dates for requisitions, make decisions on directing new repairs and procurements, negotiate with depots in planning and scheduling repairs, and renegotiate workloads based on critical shortages.

Weapon systems managers require both aggregate and detailed visibility of assets at depot- and intermediate-level maintenance organizations to assist in the planning, deployment, management, and support of the principal items and weapon systems; complete sustainability estimates; and perform programming, budgeting, and readiness assessments.

Major commands require visibility of assets at depot- and intermediate-level maintenance organizations when assessing the ability of their forces to execute planning scenarios, manage critical items with limited availability, support deployment and employment operations, monitor status and location of assets owned by or of concern to the command, and make financial decisions.

CINCs require aggregate visibility of assets at depot- and intermediate-level maintenance facilities to assess the readiness of their forces, manage critical items with limited availability, identify logistics bottlenecks in satisfying their requirements, identify theater-critical assets, formulate logistics priorities, support deliberate and crisis planning, and determine asset and lift requirements. See paragraph 4.3.5.2.

JTF commanders require aggregate and detailed visibility to manage critical items with limited availability, identify logistics bottlenecks in satisfying JTF requirements, identify critical assets, establish logistics priorities, and support deliberate and crisis planning. See paragraph 4.3.5.2.1.

Maintenance and production facilities require detailed visibility to plan, prioritize, and distribute workload and resources; determine the disposition of inbound reparables; monitor the status and location of assets supporting the repair process; support evaluation of repair performance; monitor the status and location of serviceable and unserviceable assets at intermediate maintenance facilities and depots; monitor the status and location of vendor-repaired assets; and identify materiel and equipment requirements to support programmed workloads.

Retail supply managers require detailed visibility of items due out from depot- and intermediate-level maintenance facilities to anticipate near-term replenishments, preclude redundant shipments, and help maintenance managers forecast readiness and make cannibalization decisions.

4.2.3.3 PROCUREMENT REQUIREMENTS

IMMs require visibility of procurement assets to assist in fulfilling customer orders through direct vendor delivery; improve status reporting on backordered requisitions; and project delivery dates for purposes of forecasting depot receipt workload, planning for backorder release, and assessing future item support postures.

DoD Component headquarters and major commands require visibility of procured assets to monitor the status of critical procurement actions and production of major end items.

The Joint Staff and CINCs require visibility of due in assets to assist in assessing contingency operational plans and preparing special operations plans, including Military Operations Other Than War (MOOTW). See paragraph 4.3.3.

Program managers for weapon systems require visibility of the manufacturing of major end items to monitor production and delivery schedules, plan for deliveries, and answer questions on production status and fielding from operational commanders.

Retail item managers require visibility of wholesale assets due in from procurement for materiel planning purposes.

Intermediate- and depot-level maintenance facilities require visibility of wholesale assets due in from procurement primarily for monitoring maintenance actions that are awaiting parts from wholesale supply. (Visibility of maintenance requisitions being satisfied through direct vendor delivery would occur through the maintenance facility's supporting supply activity; under the proposed TAV operating concept, that visibility would occur in the requisition tracking segment.)

IMMs require visibility of materiel stored by commercial firms under rotational contracts. Under those contracts, DoD pays a manufacturer or distributor to carry and rotate a quantity of limited-shelf-life assets that exceeds normal customer demand. This type of contract is used to avoid the costs involved in storing and disposing of materiel that might not be used before an expiration date. The materiel is owned by the manufacturer and shipped to DoD customers upon receipt of funded purchase orders.

4.2.3.3.1 Procurement AIS Links to TAV

Consistent with the principle of maintaining data in a single location whenever feasible, linkage is required between the procurement AIS, which would be the primary source of due in quantities and estimated delivery dates, and ICP AISs, which would use that information.

Although vendors and transportation carriers are required to comply with contract delivery schedules or negotiate modifications, some assets are delivered with product discrepancies or are delivered late. DoD does not consistently recover costs resulting from product and delivery discrepancies. DoD does not have an integrated data repository that collects data on product discrepancies and late deliveries; provides automated notification to contractors, contracting offices, and transportation quality assurance program offices; and serves as a database of record for carrier suspensions, and contract schedule and payment modifications.

Procurement reengineered processes, such as SPVI and MPV, must also be reviewed to determine if better customer or management access to transaction data is needed. In the specific case of SPVI, its peacetime use and high-velocity response times may not require expanded TAV.

4.2.3.4 IN-PROCESS INFORMATION

IMMs, through the ICP AIS, would maintain current data on due in quantities and estimated delivery dates, and give DoD Components and major commands, joint planning staffs, CINCs, weapon systems program managers, and retail item managers access to that information. In addition, intermediate- and depot-level maintenance facilities would access wholesale due in information through their supporting retail supply activities. Procurement due in information would be accessed through the Standard Procurement System.

4.2.4 In-storage

Materiel assets in-storage encompass all classes of supply, whether categorized as wholesale or retail. Wholesale assets, which are owned by the IMMs and include all DRMS assets, are available to fill requisitions from DoD customers worldwide. For purposes of asset visibility, retail assets are all assets maintained below the wholesale echelon of supply excluding those that are in-use. All in-use retail assets are in the possession of customers and expended from an inventory manager's records.

4.2.4.1 EXISTING SHORTCOMINGS

In most cases, managers of wholesale assets in-storage do not have vertical visibility of assets in-storage at retail- and intermediate-level storage for all commodities. Additionally, there is little horizontal visibility of other Service assets in-storage.

4.2.4.2 WHOLESALE LEVEL

TAV information is required by wholesale managers to operate effectively and efficiently. This subsection presents the wholesale manager's major functional roles followed by wholesale-level in-storage visibility requirements.

4.2.4.2.1 Wholesale-Level Functional Roles

IMMs determine if requisitions should be filled from wholesale stocks, direct vendor delivery, or lateral redistribution by balancing customer requirements with cost-effectiveness.

IMMs offset wholesale buys and repairs with retail assets beyond requisitioning objectives (ROs).

IMMs decide if retail excesses should be retained in place to meet near-term retail requirements, returned to the wholesale system, or released for other determination.

IMMs reimburse retail supply activities for costs incurred when providing lateral support at the IMM's direction.

IMMs respond to queries from other IMMs with PICA or SICA roles for information on current assets, requirements, and availability of materiel for inter-Service support.

IMMs provide supply and shipment status to requisitioners and are responsive to customers until their requirements are satisfied (to include the processing of discrepancy reports).

IMMs use retail asset visibility to prepare stratifications and annual inventory reports.

4.2.4.2.2 Wholesale-Level Visibility Requirements

For TAV purposes, visibility of wholesale assets in-storage means information on stock balances by condition code and purpose code, while visibility of materiel requirements means information on reorder points, ROs, and retention limits. Requirements for visibility of wholesale assets in-storage include the following.

IMMs require visibility of all wholesale assets they directly manage for purposes of selecting assets to fill customer requisitions, determining procurement quantities, replenishing asset levels, and making repair and disposal decisions.

IMMs that are PICAs for reparable items require visibility of all SICA assets and requirements.

IMMs that are SICAs require visibility of the assets and requirements of the associated PICA to assess its capability to support the IMMs' requirements.

IMMs require visibility of all DRMS assets to fill replenishment needs and unplanned customer requisitions.

Retail inventory managers require visibility of wholesale assets for planning purposes and answering customer questions on future availability of stock.

End-users and intermediate-level maintenance organizations require visibility of wholesale assets to execute their materiel and operational planning responsibilities.

Depot-level maintenance managers require visibility of serviceable wholesale assets for maintenance planning and expediting purposes.

Depot-level maintenance managers require visibility of unserviceable wholesale assets to prepare workload induction plans.

Logisticians on various staffs — CINCs, JTF commanders, Military Services, major commands, and weapon systems managers — require visibility of wholesale assets to assist operating forces in resolving materiel problems and assessing the logistics consequences of operational plans.

4.2.4.3 RETAIL LEVEL

TAV information is required by retail managers to operate effectively and efficiently. Retail storage refers primarily to the level where the consuming unit and its direct supply support activity interface. This subsection presents the retail manager's major functional roles and outlines basic retail-level in-storage visibility requirements for all commodities.

4.2.4.3.1 Retail-Level Functional Roles

Retail supply activities provide IMMs with asset and requirements information needed to make economical and readiness-based decisions on lateral redistribution, procurement, and repair.

Retail supply activities work to comply with the time-frames of the Uniform Materiel Movement and Issue Priority System when making lateral redistributions and provide status information to IMMs through DAAS.

Retail supply activities make asset information available to supported intermediate- and depot-level maintenance organizations for making schedule decisions and reporting status on repair actions awaiting parts.

Retail supply activities make asset and requirements information available to consumer and intermediate supply activities in the same vertical supply system.

Retail supply activities report to IMMs changes in stock balances through periodic reports by furnishing copies of issue and receipt transactions.

Retail supply activities report condition of all IMM-owned assets in their custody and, in the case of certain commodities, must perform maintenance on their inventory.

Retail supply activities process and respond to all inquiries for visibility of wholesale assets from supported customers.

4.2.4.3.2 Retail-Level Visibility Requirements

Visibility of retail assets consists of stock balances by condition code and assets on order. All on-order assets that are due in from local purchase and local repair need to be identified separately from other due in assets. Depending on the commodity, retail asset information may involve reorder points and retention

limits that must be continually monitored. DoD's requirements for visibility of retail assets include the following.

IMMs require visibility of retail assets and requirements to assist in filling customer orders through retail-to-retail lateral redistribution actions, forecast requirements, generate or defer buys and repairs, and prepare integrated retail and wholesale stratifications and annual inventory reports.

Intermediate-level retail supply activities require visibility of subordinate consumer-level retail assets and requirements so that they can fill requisitions or redistribute assets within normal supply support channels before seeking additional assets from the wholesale system or other retail supply activities.

Intermediate- and depot-level maintenance activities require visibility of assets at supporting retail supply activities to schedule their repair workloads and provide better information on the status of repair actions that are awaiting parts.

Headquarters and major commands require visibility of retail assets and requirements to assist in assessing mission capabilities, contingency operations, and planned requirements.

Weapons system managers require visibility of retail assets and requirements to assess logistics support capabilities and track item usage.

Consumer-level retail activities within the same DoD Component retail supply chain require visibility of assets at intermediate-level retail supply activities. This information is needed to support requests from local commanders for supply support assessments of requirements, such as those associated with field training exercises or contingency operations.

4.2.5 In-transit

The term "movement status" is used in this section for the purposes of brevity. Wherever the term "movement status" is used, the status information required includes item and person identification, current location, and movement itinerary. The term *"current* movement or supply status" refers to the latest logical (implies sequential) supply or transportation event recorded with all events required to be recorded and accessible to a customer within 4 hours or less for events occurring outside of a theater and near-real-time (at least within a half hour) of events occurring within the theater.

4.2.5.1 EXISTING SHORTCOMINGS

In-transit visibility shortfalls that exist include many fragmented automated systems and databases that are often referred to as "stovepiped" systems. Consequently, customers outside each transportation operational activity do not have

access to data in the DoD and commercial transportation systems that control and document the movement of materiel and personnel. No source provides end-to-end visibility so a customer can view all transportation data related to the movement of an asset. When access has been granted to multiple transportation automated systems, the information required often cannot be found because of different data standards and unknown data relationships, such as which transportation control number (TCN) belongs to which requisition number, deployment increment number, or NSN. Other in-transit information shortfalls include data quality problems such as improperly documented shipment consolidations, data timeliness problems such as shipment status information recorded out of sequence or before the basic shipment record is placed on a database, and a near-complete loss of content-level visibility when shipments are made direct from commercial venders.

Detailed requirements for in-transit visibility are documented in the GTN ORD and the *Defense In-transit Visibility Implementation Plan*. This section highlights key in-transit visibility requirements and further refines these requirements based on interviews, recent studies and reports, and user feedback from the September, 1996, Global JTAV Users Conference.

4.2.5.2 REQUISITION MOVEMENT STATUS

All ordering activities within the DoD supply chain must have access to the most current transportation movement status of each requisition submitted or processed by their respective organization.

4.2.5.3 SHIPMENT TRACKING

DoD logistics activities that ship, receive, or store materiel must have the capability to access item and shipment information for all inbound and outbound shipments moving to and from their activity. This capability must include visibility of shipments from DoD activities as well as direct vendor shipments, CLS shipments, express carrier shipments, mail shipments, and host nation support (HNS) shipments. CONUS and theater item managers, retail supply activities, and maintenance support activities need a capability to track retrograde shipments as items are being returned for reissue, repair or disposal.

4.2.5.3.1 Flexible ITV Inquiry Capability

DoD ordering activities, logistics activities, and CINC and Service logistics staffs must have the interoperability and flexibility to initiate ITV movement status inquires using data terminology. Inquiries must accommodate key data names, including requisition number, purchase order number, vendor or DoD item identification number, ammunition DoD identification code (DODIC), unit identification, geographic location code, transportation activity codes (such as aerial port of debarkation [APOD], water port of debarkation, [WPOD], trailer

transfer point [TTP], and container consolidation point [CCP]), TCN (both lead and content level), bill of lading number, container number, conveyance number (ship voyage number, truck owner/number, rail car owner number, aircraft owner/tail number), and unit line number (ULN). The task of cross-referencing relationships between all key control numbers must be transparent to the customer. This requirement is also a theater requirement. See paragraph 4.3.5.2.2.

4.2.5.3.2 Tracking for Military Operations Other Than War

The Joint Staff J-1/J-3/J-4, supporting CINC J-1/J-3/J-4 staffs, supported CINC J-1/J-3/J-4 staffs, as well as Service headquarters and major command deployment, personnel, and logistics managers require the capability to identify materiel and personnel shipments and the related movement status for MOOTW.

4.2.5.3.3 Deployment Force Tracking

The Joint Staff J-1/J-3/J-4 staffs, supporting CINC J-1/J-3/J-4 staffs, supported CINC J-1/J-3/J-4 staffs as well as Service headquarters and major command deployment, personnel, and logistics managers require visibility of the readiness status and actual movement of all deploying forces, both active and reserve. These requirements include personnel and equipment authorized and assigned, determination of personnel and equipment readiness, training readiness, earliest date available for movement from home station, actual movement from home station through mobilization station, ports of embarkation (POEs) and PODs, and onward movement to the initial in-theater reception point.

4.2.5.3.4 Inbound Shipment Tracking for Maintenance Activities

Maintenance activities must have movement status of materials, parts and components inbound. This information must be near real-time to permit managers to make timely workload scheduling or alternative sourcing adjustments.

4.2.5.3.5 Weapon System Tracking

Weapon system managers (equipment fielding teams) and maintenance activities for weapon systems require visibility of new weapon systems en route to field units, visibility of parts and major assemblies associated with each weapon system, and in-transit information of specific parts shipments, including date shipped, current location, expected and actual date of receipt by the intended consignee, and notification of discrepancies that may have been incurred while in-transit.

4.2.5.4 AUTOMATED DEPLOYMENT ANALYSIS

The Joint Staff J-1/J-3/J-4, the Joint Transportation Board (JTB), and supporting CINC J-1/J-3/J-4 staffs, supported CINC J-1/J-3/J-4 staffs, as well as Service headquarters and major command deployment, personnel, and logistics managers

require an automated and continuous capability that accesses actual and planned data, analyzes the data and provides aggregate status summaries by operation. These status summaries should include total personnel and equipment (tonnage or shipment units) initially required to be moved, actually moved, remaining to be moved by location down to the unit level (battalion, squadron, task force, fleet, ULN, force requirement number [FRN]). In addition, JTB members require visibility of lift assets by type and allocated theater, backlog of passenger traffic, and backlog of cargo by commodity and priority. See also Section 4.3, Theater Requirements.

4.2.5.5 LOGISTICS RESPONSE TIME ANALYSIS

OSD and Military Service logistics staff elements and transportation operations headquarters require access to aggregate movement statistical data (logistics responsiveness between nodes) to monitor and study potential improvements in logistics response time.

4.2.5.6 VERIFICATION OF COMMERCIAL FREIGHT CARRIER DELIVERIES

Failure to promptly certify and compute the amount payable to a carrier is a violation of federal prompt payment laws and causes DoD to pay unnecessary interest penalties. Shippers require ITV over their shipments to certify carrier invoices for payment. Service transportation activities (shippers) that issue GBLs for transportation services must have the capability to quickly determine when a shipment reaches its destination and verify if fees (assessorial charges) are payable. This information should be available to the origin shipper not later than 48 hours after final delivery occurs.

4.2.5.7 SENSITIVE SHIPMENT VISIBILITY

The sensitive nature of certain shipments require real-time tracking capabilities. DoD transportation operations and security personnel must have real-time tracking visibility of blood, ammunition projectiles, explosives, missiles, small arms and major weapon systems, and other shipments considered by DoD shippers to be high-dollar-value and pilferable, dangerous, sensitive, or classified. These special commodities require the use of satellite surveillance and other systems to provide real-time tracking during their movements.

4.2.5.8 IN-TRANSIT CARGO FORECAST

ITV and transportation systems that collect movement data do not notify customers when or what assets are inbound to their location. While some ITV and transportation systems allow users to initiate an inquiry if they are looking for an

item, no current system automatically notifies an ultimate consignee that a shipment is inbound and how to obtain status updates routinely. The ultimate consignees must receive forecasts of in-transit shipments, including individual item details.

4.2.6 Personnel Visibility

The personnel aspects of JTAV are being addressed as a coordinated effort within the *Military Personnel Management for the 21st Century* (MPM-21) development process to improve total force personnel services and support. The *CINC and JTF Personnel Asset Visibility Functional Requirements Document,* 11 June 1996, by the Defense Information Systems Agency further provides requirements in greater detail that are the basis for defining the JPAV needs of theater commanders.

People are a critical asset to any military mission. Personnel managers ensure maximum force mission readiness and sustainability by

  ◆ determining force requirements,

  ◆ identifying units and individuals to match needs,

  ◆ accurately accounting for forces and shortfalls,

  ◆ initiating sustainment support programs, and

  ◆ meeting the personnel needs of forces in-theater.

Personnel asset visibility is the visibility of individual, unit, and location data that describe all personnel resources available to accomplish a JTF mission. Personnel must be tracked from deployment at a POE to a final event such as redeployment, medical evacuation, or death. Status of personnel in-transit to a JTF, locations of units and individuals within a JTF, and the number of personnel evacuated or redeployed must be known. See Section 4.3 for specific theater requirements.

4.3 THEATER REQUIREMENTS

Theater requirements include the need for theater as well as global information. Similar to CONUS requirements, not all theater requirements are anticipated to be met by a software and hardware solution, a single computer system integration or interface, or a defined set of procedural changes. Solutions for theater visibility requirements will most likely include a combination of these to achieve TAV objectives.

Deployment process requirements are primarily established from the perspectives of the supported CINC, supporting CINCs, and their Military Service components. Throughout this section the term "theater commander" is used to represent both

the supported CINC and the JTF commander. "Theater" refers to both a CINC's area of responsibility as well as a JTF commander's theater of operations.

Some of the following requirements are similar to those in Section 4.2, JTAV General Requirements. In those cases, JTAV users in both CONUS and the theater share the need for similar information. To preclude the implication that theater commanders and activities do not have some of the same needs for information, applicable visibility requirements are restated in this section, but from the view of a theater commander or theater logistics and personnel activities.

A theater commander's distribution operations begin in the sustaining base with detailed data requirements and do not end until the asset – materiel or personnel – is delivered to its ultimate location, including redeployment. The success of joint theater distribution operations is a function of three critical components: visibility, control, and capacity. These three components are required in all operational phases of a deployment. Each component requires accurate, reliable, and up-to-date information.

Logistics infrastructure, such as facilities and transportation networks, is an asset that must also be managed. While these types of assets are important to monitor in the CONUS base, infrastructure capacity and utilization information is more critical in a theater of operation.

In-theater distribution requirements are divided into these four areas: predeployment, deployment, employment, and redeployment. While each area has unique requirements, many requirements apply to all areas and must be presented to accomplish the broad requirements of total distribution management. Personnel and logistics information requirements are presented in each phase. Requirements for noncombatant evacuation operations (NEO) and special medical support requirements are also included.

4.3.1 CINC Responsibilities

The activities and roles of the supported and supporting CINCs change as units are prepared for deployment, deployed, and finally transferred to the supported CINC for operational control. Together these responsibilities create enormous needs for asset visibility. The following general responsibilities of supported and supporting CINCs form the basis of in-theater TAV requirements:

◆ Support deliberate and crisis action planning

◆ Allocate critical assets

◆ Identify and resolve in-theater logistics bottlenecks

◆ Monitor the status, capability, and availability of strategic mobility assets

- Determine requirements for additional asset and lift capability

- Support theater doctrine, budget, and procurement decisions

- Manage the predeployment, deployment, reception, onward movement, integration, and employment of inbound forces and supplies

- Manage all intra-theater movement of assets

- Manage the redeployment of forces and the retrograde of materiel

- Identify the status, quantity, and location of all pre-positioned assets

- Continually assess the status and location of unit equipment and cargo, major end items, and sustainment materiel deployed to the theater of operations

- Monitor personnel destined for, operating in, or departing from the theater

- Manage theater HNS requirements

- Identify host nation capabilities

- Support MOOTW.

4.3.2 Existing Shortcomings

Joint systems have many shortcomings that relate to four major areas – the inability of a theater commander to (1) "look back" into wholesale inventories throughout DoD, (2) assess actual readiness of forces during predeployment, (3) determine actual movement status, (4) query theater inventories vertically and horizontally across Service stocks, and (5) determine logistics infrastructure capacity and utilization. These TAV deficiencies are addressed in more detail in the following subsections.

4.3.3 Predeployment

During predeployment, theater commanders and their staffs must develop courses of action. Operational planners and logistics and personnel staffs must evaluate these COAs and determine if the resources to support a particular COA can be made available and if the COA is supportable. Existing information and analytical tools do not provide adequate visibility or timely responsiveness for a thorough assessment. In many cases, the COA assessments are given little or no logistical analysis before a preferred COA is approved. Joint planning staffs must have rapid access to asset data and state-of-the-art analytical tools for predeployment planning and supportability analysis.

4.3.3.1 WORLDWIDE VISIBILITY OF DoD ASSETS IN-STORAGE

Joint operational planning staffs do not have adequate visibility of DoD assets on a worldwide basis. In most cases, theater commanders only have visibility of designated theater WRS within their own theater. Access to Service-held stocks and stocks in CONUS storage is practically nonexistent. This lack of visibility is critical in the early stages of predeployment planning when the theater commander's staff must prepare a logistics supportability assessment for a COA. The logistics staff must have access to the location, quantity, owner, and availability of allocated WRS and theater retail stocks as well as all DoD wholesale materiel, equipment, and major end-item assets worldwide. Access to this data must be provided accurately and rapidly to assess multiple COAs within a short time.

4.3.3.2 VISIBILITY OF HOST NATION SUPPORT

A supported theater commander's logistics staff and Military Service Components must be able to analyze rapidly the commodities and services that have been pre-arranged by HNS agreements and determine the procedures that must be followed to activate those agreements. Additionally, during time-phased force and deployment list (TPFDL) sourcing, an analytical capability is needed to identify the type and percentage of sustaining resupply requirements that can be offset by HNS.

4.3.3.3 VISIBILITY OF COALITION FORCE LOGISTICS REQUIREMENTS AND CRITICAL SHORTFALLS

When assigned the lead for logistics support of a multinational force, the supported theater commander's logistics staff must have the capability to rapidly obtain visibility of coalition and multinational force logistics requirements and identify critical shortfalls. In addition, theater commanders must be able to provide visibility of U.S. assets to coalition partners as required by mutual support agreements.

4.3.3.4 VISIBILITY OF FORCE READINESS

Supporting and supported CINCs require access to unit readiness postures to include training status, equipment readiness status, and the available load date for deployment from home station and if applicable, mobilization station. Supporting CINCs are concerned with the status of deploying units, the measures that must be taken to prepare the organizations and personnel for deployment, and the projected date that units will be available to deploy.

Critical visibility requirements for active duty organizations apply to materiel, supplies, and unit equipment on order or in repair. For unit personnel, on-hand versus required strength are key data that determine the unit's readiness to deploy. Although the Military Services have readiness reporting systems, the supporting

CINC rarely has access to that information and must rely on a variety of headquarters to obtain the information. The supporting CINC needs accurate details quickly during predeployment that show the unit status and measure what the unit has on hand or can receive prior to deployment.

Reserve units present a more complex set of visibility issues for the supporting CINC. This complexity is inherent in the training status and geographic dispersion of some of these units. A theater commander needs the same information to plan for reception and onward movement or to direct a deployment delay.

Supporting and supported CINCs require the capability to identify assigned and deploying unit requisitions that are needed to return equipment to mission-capable status. The capability must exist for CINC logistics staffs to analyze and identify the supply and in-transit status of mission-critical requisitions as well as the availability of interchangeable and substitutable supply items.

4.3.3.5 FORCE GENERATION CAPABILITY

Theater commanders determine "type unit" requirements and priority of deployment of major warfighting units (above the line forces) as part of their initial, notional TPFDL. The JPEC refers to the activity of identifying actual units with the same capabilities and availability date as the notional units as "force generation, force build, or sourcing the TPFDL."

Supporting CINCs, with their Military Service components, undergo a constant TPFDL-build process throughout the predeployment and deployment phases that seldom satisfactorily answer how big the deploying force is and how much strategic lift will be needed to deploy it. Furthermore, as force readiness and availability information becomes available, deletions, additions, and substitutions of units or parts of units are continuous. To provide stability to the force generation process and minimize changes, the supporting CINCs require accurate unit capability information, equipment deployment characteristics, and up-to-date readiness data. A single-source, rapid capability permits the supported CINC to determine which specific units are mission capable and available to become the actual deploying force and to estimate their strategic lift requirements.

4.3.3.6 ANALYTICAL AND DECISION SUPPORT TOOLS

The supported CINC, supporting CINC, JTF, and Service component logistics and personnel staffs require an analytical capability to develop and validate theater requirements, including the computation of consumption factors, for personnel and sustainment in all classes of supply. Once the theater requirements are determined, a method of tracking the actual sourcing and shipment of materiel to satisfy these requirements must be used with an automatic capability to warn logistics staffs when actual sourcing and shipment have not occurred as planned.

4.3.3.7 PREDEPLOYMENT PERSONNEL PLANNING

The theater commander's J-1 is responsible for personnel planning in support of joint operations. Personnel planning includes the identification and determination of available units and specific personnel skills. The J-1 requires the following capabilities during predeployment.

4.3.3.7.1 Theater Personnel Authorization Documents

The theater commander's J-1 requires the capability to develop personnel authorization documents for the theater based on deliberate planning or ad hoc task organizations initially tasked in a plan. The J-1 requires a capability to have changes to the TPFDL automatically update personnel authorization documents.

4.3.3.7.2 TPFDL and Theater Personnel Authorization Documents Synchronization

The CINC J-1 requires a capability to rapidly associate personnel authorization document requirements to specific TPFDL ULNs and PINs.

4.3.3.7.3 Military Skills Identification

The CINC J-1 requires the capability to link military occupational codes of the four Military Services, the Coast Guard, and civilian counterparts to military occupation codes.

4.3.3.7.4 Personnel In-theater

The CINC J-1 requires the capability to match personnel in-theater with personnel requirements, to include civilian augmentees, reflected in personnel authorization documents. The CINC J-1 needs the ability to determine the availability of certain skills both in-theater and worldwide. This involves the capability to match individual personnel skills, such as a specific type of linguist, with Service component databases in-theater as well as a worldwide personnel skills data source.

4.3.3.7.5 Personnel Analytical Capability

The CINC J-1 must have the capability to perform analysis, such as gender, home of origin, race, and religion, and other force demographics based on personnel requirements as identified in personnel authorization documents and the TPFDL.

4.3.3.8 MEDICAL ASSET VISIBILITY

During predeployment, theater medical planners require the same visibility over available medical materiel, equipment, and unit readiness as other logistics support disciplines. Two areas – blood supplies and the ability to track medical

capability (force generation) and workload from predeployment through redeployment – are worthy of special mention.

4.3.3.8.1 Blood Supplies

The theater surgeon, medical planners, and blood managers must have near-real-time visibility of blood shipments by type, quantity, current location, and if in-transit, shipment itinerary.

4.3.3.8.2 Medical Capability Assessments

Theater medical planners and logistics managers must have accurate and near-real-time information on theater medical unit requirements, available units in-theater and en route, medical skills available and en route, requisition/order and on-hand status of medical materiel, and medical unit operational status.

4.3.3.9 LOGISTICS INFRASTRUCTURE

Theater logistics staffs and logistics support activity commanders must have total visibility of the distribution network capacity with sufficient detail to rapidly detect frustrated cargo and bottlenecks at storage areas, roadways, railways, airfields, water ports and transition nodes. This visibility must be accompanied by the capability to direct diversions, reroute, and apply additional lift or materiel-handling capability to any location. This requirement exists through all phases of the joint deployment process. The theater commander's staff must also have the ability to retain theater distribution data to update deliberate plans and develop future logistics support plans.

4.3.3.10 PREDEPLOYMENT NEO PLANNING

The supported CINC J-1 has the overall responsibility for NEO planning and execution. All non-combatants (NCs) – command and non-command sponsored – are required to be registered and included in the appropriate unit commander's NC roster until their departure from the area. For efficient implementation, as many NCs as possible must be identified in advance of a NEO contingency. NCs may be identified from many information sources, including direct information from DoD-affiliated personnel and personnel of other federal agencies, the overseas command's rations control systems, the Defense Enrollment Eligibility Reporting System, and Department of State records. The CINC J-1 requires a consolidated NEO database containing information from these sources.

A theater commander needs the capability to link this data to other personnel systems and authorization documents to maintain up-to-date information as personnel arrive and depart the theater. The primary information elements required for a NEO database are as follows: name, date of birth, gender, special medical needs,

nationality/citizenship, sponsor's name and unit or employer, relationship to sponsor, local address, and emergency contact.

Supported theater commanders also need visibility of NEO staging facility requirements, the planned allocation of NCs to facilities, gross storage requirements of NC personal property, and anticipated household pet populations.

4.3.4 Deployment

The supported and supporting CINCs require total visibility over actual force and sustainment materiel movements during the deployment process and the ability to map operational transportation data to corresponding TPFDL line entries. A supported CINC requires this information early to begin the planning processes to schedule and position combat service support assets and HNS to provide for the smooth, timely, and efficient flow of unit equipment, personnel, and sustainment into or through the theater staging areas. This information would allow a theater commander to reprioritize assets being sent to the theater based on operational considerations.

4.3.4.1 EXISTING SHORTCOMINGS

During deployment, supporting CINCs, the Joint Staff, and theater commanders have great difficulty determining if the deployment is proceeding according to plan. This lack of visibility is primarily caused by the joint community's inability to gain access to, and compare actual movement information from, transportation activities to TPFDL line items. This shortcoming prevents joint and Service logistics and personnel staffs from being able to provide actual and anticipated force closure information to command and operational staffs. The problem is especially difficult for vaguely defined portions of the force, such as above-the-line forces.

The supported CINC J-1 is responsible for keeping track of all personnel entering or exiting the theater, including patients and noncombatant evacuees. However, the J-1 does not have a consistent and reliable capability to capture entry and exit information, and rapidly link that information to a source database such as theater personnel authorization documents and the theater visitor clearance system. Numerous military, diplomatic, and commercial avenues permit individual military and civilian augmentees, support contractors, news media, and official visitors to enter and leave the theater. Consequently, except for gross unit personnel figures, the theater commander does not have accurate information of all nonindigenous personnel that have arrived and are in-theater.

4.3.4.2 DEPLOYMENT VISIBILITY REQUIREMENTS

Specific requirements for deployment visibility, including requirements for NEO operation visibility, are presented in the following subsections.

4.3.4.2.1 Unit Movements

Joint deployment planning staffs and Service logistics and personnel staffs must have visibility of the actual movement status for unit equipment, accompanying supplies, and personnel assets moving to, from, and within any theater and be able to associate the actual movement data with specific line items (such as the ULN) in the deployment plan. The supporting and supported CINCs have little or no capability to track reserve component units as they move from home stations to the assigned mobilization installation. Subsequent to arriving at their mobilization installation, these units are as visible as their active counterparts. Both the supporting and supported CINCs have the requirement to see the buildup of the forces. A supporting CINC must ascertain the status and provide support as the unit moves through the deployment process.

4.3.4.2.2 Force Closure and Combat Readiness Assessment Capability

Joint deployment planning staffs, Service contingency operations logistics and personnel staffs, and joint operations tactical planners require end-to-end "force tracking" capability. This tracking capability includes the requirement to compare rapidly unit specific information, such as equipment and personnel authorizations, with personnel assigned, actual condition of equipment, and unit-level actual training readiness status. This capability must be able to track units and parts of units, such as "above the line" forces of a MEF, division or separate brigade, and equipment from home station through a mobilization station and onward to the in-theater point of initial tactical deployment. Associated with this requirement is the need for visibility of actual and projected force closure as well as information that allows the supported theater commander to determine if sufficient combat power and sustainment capability is equipped, trained, and prepared to commence an assigned combat mission.

4.3.4.2.3 Visibility of Nonunit Personnel Movements

Visibility of individual replacements and augmentees from initial notification and mobilization to deployment and reception into the theater require the same detailed information requirements as units and sustainment. Theater commanders, joint deployment planning staffs, and Service contingency operations logistics and personnel staffs must have movement status visibility of nonunit passengers, patients, and evacuees moving to, from, and within any theater. This visibility must make it easy to associate individual names, as well as Service or agency and Social Security numbers, with actual movement data, and specific line items (such as the personnel increment number, PIN) in the deployment plan. The supported CINC J-1 must have visibility of U.S.-sponsored visitors, civilian support contractors and official temporary duty government employees as they enter and exit the theater.

4.3.4.2.4 Nonunit Sustainment

Theater commanders, their logistics staffs, and theater Service Components require visibility of nonunit sustainment assets from the point of origin to the point of receipt by the theater consignee. This requirement includes shipments originating from vendor and government points of origin. It includes full content-level details down to individual shipment unit, item identification number, and requisition identification number, if applicable. Theater customers and logistics staffs must have the capability to shift between TPFDL cargo increment numbers (CINs) and operational shipment identification numbers, such as TCNs, GBLs, commercial bills of lading, and commercial transportation carrier identification numbers.

4.3.4.2.5 Visibility of Push Sustainment Supplies

Theater logistics staffs and Service direct and general support supply activities must have visibility of sustainment supplies being pushed into a theater. This requirement includes content-level details, intended theater consignee, shipment and item identification number relationships, and shipment itineraries. Theater logistics staffs, as a minimum, must have access to this information from all Service supply chains.

4.3.4.2.6 Special Item Visibility

Theater commanders and theater logistics staffs require visibility of personal mail, donated assets, special NEO support equipment, and humanitarian relief supplies to include specific content item identification, quantity, current location, and shipment itinerary. Theater logistics activities must have the capability to search for critically needed items (critical and "hot item" lists) that are in-transit to the theater regardless of location, ownership, and intended destination.

4.3.4.2.7 In-Theater Transient Sustainment Assets

A theater commander's logistics staff and Service component logistics staffs require the capability to track nonunit sustainment cargo after it has arrived in-theater but has not reached its intended accountable records activity. This requirement includes having visibility of sustainment shipments in ports of discharge, transit holding areas, and temporary storage until a retail activity database, general supply support activity database, or unit (consumer) has recorded the asset as on-hand inventory.

4.3.4.2.8 Blood Supplies

The theater surgeon, medical planners, and blood managers must have near-real-time visibility of blood shipments by type, quantity, current location, and if in-transit, shipment itinerary.

4.3.4.2.9 Medical Capability Assessments

Theater medical planners and logistics managers must have accurate and near-real-time information on theater medical unit requirements, available units in-theater and en route, medical skills available and en route, requisition/order and on-hand status of medical materiel, and medical unit operational status.

4.3.4.2.10 Medical Patient Tracking

As combat units move across a battlefield or over many miles of sea, theater medical managers as well as unit commanders must have rapid access to current patient status and location (including inter-Service patient treatment) and patient movement items. A capability is also needed to update medical patient records efficiently and automatically with changes in the actual location of the patient's assigned unit.

4.3.4.2.11 NEO

The supported CINC J-1 and J-4 require the ability to identify available transportation to move NCs to staging facilities and from staging facilities to ports of exit. A near- real-time capability is also needed to allow the supported CINC J-1 and J-4 to document and monitor the following NEO information:

- ◆ NC arrivals and departures at staging facilities and theater ports of exit.

- ◆ Priority of movement for NCs

- ◆ Personal property location and household pet information for each NC

- ◆ Association of current location and planned or actual departure information of NCs with a NEO database and the NEO TPFDL (if constructed)

- ◆ Reconciliation of passenger manifest for strategic lift with NEO database.

4.3.4.2.12 Logistics Infrastructure

Theater logistics staffs and logistics support activity commanders must have total visibility of the distribution network capacity with sufficient detail to rapidly detect frustrated cargo and bottlenecks at storage areas, roadways, railways, airfields, water ports, and transition nodes. This visibility must be accompanied by the capability to direct diversions, reroute, and apply additional lift or materiel-handling capability to any location. This requirement exists through all phases of the joint deployment process. A theater commander's staff must also have the ability to retain theater distribution data to update deliberate plans and develop future logistics support plans.

4.3.4.2.13 Theater Transportation Visibility

During all phases of joint deployment operations, but especially the deployment and employment phases, theater logistics staffs and transportation mode operators must have accurate and timely theater transportation visibility. A fully integrated capability is needed to maintain visibility over total theater transportation requirements, theater transportation lift assets, movement status, and transportation bottle-necks. The theater transportation system must be capable of integrating host nation and coalition force requirements and lift assets with U.S. requirements and lift assets, and provide standard documentation to permit visibility of all transportation movements within theater. A large percentage of transportation movements in-theater may be accomplished by commercial carriers and transportation services provided by other nations. Visibility of the movement status and delays in movement of all U.S. assets, including those being handled by non-U.S. arrangements, is essential.

4.3.4.2.14 Enemy Prisoners of War

Although prisoners of war (POW) are not considered assets to DoD, their existence presents the theater or contingency operations commander with the need for information on the number, names, and nationalities by holding areas. Additionally, holding area capacity and utilization data are needed by the J-1, J-3, and J-4 for making prisoner assignments, caretaker assignments, and planning and providing logistical support.

4.3.5 Employment

Many requirements for the visibility of wholesale and retail sustainment are presented in Section 4.2, JTAV General Requirements. Those requirements are based on the need for visibility of sustaining supplies and equipment moving to forward-based activities without regard to a contingency deployment. Within a theater of operations, contingency operations place unique demands on required JTAV capabilities. This subsection presents additional employment visibility shortfalls and requirements applicable to a contingency deployment.

4.3.5.1 EXISTING SHORTCOMINGS

Theater commanders and their planning and logistics staffs do not have the ability to identify requisitions and shipments in the supply pipeline destined for a theater before the commencement of a deployment. Shipments ordered or pushed to a theater to offset a specific contingency employment requirement are also not visible. Materiel that was en route to deploying units at the commencement of a deployment must be diverted to their new location; however, units and staffs do not have an effective way to identify these shipments and influence a diversion. Materiel that may have been in a location that is no longer accessible due to hostilities must be identified and, if necessary, reconstituted; however, the inventory and

ownership information is fragmented among multiple databases and manual records. Reconstitution of such assets is a difficult task and is further complicated by incomplete visibility information.

4.3.5.2 THEATER EMPLOYMENT REQUIREMENTS

Theater commanders have many of the same needs for visibility as described in Section 4.2, JTAV General Requirements. However, theater commanders, logistics and personnel staffs and other TAV customers also have additional requirements precipitated by a joint deployment event. The following requirements represent the CINCs additional employment visibility needs.

4.3.5.2.1 Logistics Infrastructure

Theater logistics staffs and logistics support activity commanders must have total visibility of the distribution network capacity with sufficient detail to rapidly detect bottlenecks at storage areas, roadways, railways, airfields, water ports, and transition nodes. This visibility must be accompanied by the capability to direct diversions, reroute, and apply additional lift or materiel-handling capability to any location. This requirement exists through all phases of the joint deployment process. A theater commander's staff must also have the ability to retain theater distribution data to update deliberate plans and develop future logistics support plans.

4.3.5.2.2 Flexible ITV Inquiry Capability

Theater ordering activities, logistics activities, and theater commanders' logistics staffs must have the interoperability and flexibility to initiate ITV movement status inquires using data terminology. Inquiries must accommodate key data names, including requisition number, purchase order number, vendor or DoD item identification number, ammunition DODIC, unit identification, geographic location code, transportation activity codes (such as APOD, WPOD, TTP, and CCP), TCN (both lead and content level), bill of lading number, container number, conveyance number (such as, ship voyage number, truck owner/number, rail car owner number, aircraft owner/tail number), ULN, and CIN/PIN. These requirements are similar to those presented in paragraph 4.2.5.3.1.

4.3.5.2.3 Theater Employment Requirements – Requisition Status

Theater customers must have the capability to determine the status of their requisitions.

4.3.5.2.4 Theater Employment Requirements – Assets In-Process

Theater requirements for assets in-process include those in the process of being procured and those in repair and as described in the following subsections.

4.3.5.2.4.1 Assets In Procurement

Like CONUS-based activities, theater customers require a visibility of items being procured by contract, purchase order or delivery order resulting from a purchase request or requisition. Other procurement visibility requirements include in-theater procurements for goods and services from local contracting actions or through contingency agreements such as the Logistics Civil Augmentation Program. Visibility of multinational force contract activities (such as NATO or United Nations contracts) is also required.

4.3.5.2.4.2 Assets In Repair

Theater commanders and their logistics staffs require visibility of items in repair, both in-theater and at the depot level. Visibility of items being repaired and returned to stock is needed to offset new requirements. Visibility of repair parts and assemblies needed to return repairable items to mission-capable status is required to project asset availability and to monitor logistics responsiveness.

4.3.5.2.5 Theater Employment Requirements – Assets In-Storage

Theater commanders and their logistics staffs require visibility of assets in-storage, both outside and within the theater. This includes the requirements in the following subsections.

4.3.5.2.5.1 Visibility of Materiel Assets Outside the Theater

Theater commanders and their logistics staffs require visibility of assets outside their theater. This visibility requirement includes CONUS and OCONUS depot-level assets in-storage, war reserve and pre-positioned assets allocated to other theaters, commercial medical supplies in storage in the private sector, and retail assets in-storage. Also a requirement exists for visibility of major equipment and end items (including weapon platforms) that are available in-storage or in use above organizational authorizations. This requirement for visibility includes intra- and inter-Service and agency visibility.

4.3.5.2.5.2 Visibility of Materiel Assets Inside the Theater

Theater commanders and their logistics staffs require visibility of all assets located in the theater, both in-storage and in use. This requirement includes all major equipment and end items (including weapons platforms) within the theater.

4.3.5.2.6 Visibility of Personnel

The supported CINC J-1 requires the capability to maintain an inventory of all personnel entering or exiting the theater and current location of personnel within the theater. Access is required to worldwide information sources that contain standardized military skills, with the capability to match skills needed with actual personnel data both inside and outside the theater.

4.3.5.2.7 Visibility of Bulk Fuels

A theater commander's fuels managers and operational POL units require in-transit visibility of all DoD shipments of bulk fuels. Information required includes the type of fuel, amount, and current location. If the fuel is in or en route to the theater, information required also includes destination customer, carrier's conveyance identification, shipment itinerary, current location, and expected destination arrival date.

4.3.5.2.8 Blood Supplies

The theater surgeon, medical planners, and blood managers must have near-real-time visibility of blood shipments by type, quantity, current location, and if in-transit, shipment itinerary.

4.3.5.2.9 Medical Capability Assessments

Theater medical planners and logistics managers must have accurate and near-real-time information on theater medical unit requirements, available units in-theater and en route, medical skills available and en route, requisition/order and on-hand status of medical materiel, and medical unit operational status.

4.3.5.2.10 Medical Patient Tracking

As combat units move across a battlefield or over many miles of sea, theater medical managers as well as unit commanders must have rapid access to current patient status and location (including inter-Service patient treatment) and patient movement items. A capability is also needed to update medical patient records efficiently and automatically with changes in the actual location of assigned units.

4.3.5.2.11 Theater Employment Requirements – Assets In-transit

Theater commanders and logistics staffs must have movement status visibility of nonunit sustainment shipments from the time the items are released from storage and provided to a transportation office to the time they are received at final destination in-theater. Key events and data that must be visible are item contents (consolidated into shipment units), date departed from origin, arrival at POE, departure from POE, arrival at POD, departure from POD, arrival at a transition node (distribution center, break-bulk point, transfer point, shipment reconfiguration, and consolidation point), departure from a transition node, and arrival at consignee. The following subsections provide more details on specific employment requirements.

4.3.5.2.11.1 Visibility of Nonunit Sustainment Assets Inbound to a Theater

Joint deployment planning staffs and Service contingency operations staffs must have access to the movement status of nonunit sustainment assets inbound to a theater. In many cases, theater logistics managers must search for a particular item rather than a requisition. Theater users must be permitted to inquire by TPFDL line number, item identification number, unit identification number, activity address code, geographic location, destination, and origin. Required information includes quantity, current location, intended destination activity, and shipment itinerary.

4.3.5.2.11.2 Visibility of Nonunit Sustainment Assets Moving Within Theater

Joint and Service component logistics staffs within theater require the capability to identify assets in-transit throughout the theater, determine actual movement status, direct diversions or reconsignments, and reconstitute shipments lost or damaged. Also see paragraph 4.3.4.2.13.

4.3.5.2.11.3 Timely Access to Air Shipment Information

Air delivered assets often move faster than data that identify and describe the shipments. Since air transportation is a scarce resource, the receiving theater must have visibility of the cargo in and en route to originating air terminals as well as the capability to reprioritize planned plane loads of sustainment shipments. Theater logistics staffs and logistics activities require near-real-time visibility of air shipments as they move from shippers and consolidation points to and from aerial ports of embarkation (APOEs) as well as the most current expected arrival times of air shipments at APODs.

4.3.5.2.11.4 Accurate Shipment Content Details

A large percentage of nonunit sustainment supplies are consolidated into unitized loads (pallets, skids, shrinkpacks, conex, and containers). Commodity identification numbers, individual requisition numbers, and individual shipment numbers often loose their identity during documentation processes. Theater logistics staffs, theater customers, transportation component commands of the U.S. Transportation Command (USTRANSCOM), and deployable transportation activities must have timely and accurate visibility of shipment content details from the time the item is prepared for shipment, through transportation nodes, until it arrives at the consignee. A capability must exist to provide access to those details in advance of the actual cargo arrival for receipt and operations planning.

4.3.5.2.11.5 Visibility of Subsistence Content-Level Details

Currently shipment documentation only identifies a shipment of subsistence as a general commodity. Subsistence managers, inquiring about a specific type of food, usually cannot tell what type of food is in the shipment until the shipment arrives and its contents are inspected. Theater subsistence managers, joint deployment

logistics planners and Service components require rapid and accurate visibility of requirements, in-transit inventories, and in-storage inventories of subsistence to include content characteristics, while in-transit to or stored in a theater.

4.3.6 Redeployment

Redeployment is an enormous logistics and personnel operation and should be as well planned and controlled as any operation supporting combat forces. Unfortunately, redeployment activities of U.S. forces have historically relied on the "sort things out back home" philosophy. Redeployment has not received the same level of planning, infrastructure support, and leadership interest as deployment. However, this phase is a key to reconstituting our national defense capability, providing U.S. forces with the ability to quickly recover from a conflict to prepare for the next national priority or to move to a second theater in support of another contingency.

4.3.6.1 EXISTING SHORTCOMINGS

Deployments are "simple" when compared to redeployment issues. Home stations provide substantial external support to assist in the deployment. In-theater, however, units generally redeploy themselves without the availability of the external support that assisted them in their initial deployment. Fixed base installations and the installation support structures, such as installation transport-ation offices, serve as deployment platforms. There are no parallel deployment platforms for forces and organizations in redeployment.

During deployments, units deploy with a preestablished set of equipment and materiel. Movement characteristics and documentation have been refined during many rehearsals. When an operation ends, units have built "operational" equip-ment and materiel stores that may require far greater strategic lift assets to rede-ploy than the units required to deploy initially to the theater.

The wholesale or CONUS support base is better configured to process outbound sustainment than to manage returning sustainment stocks. War reserve programs are designed to identify, document, and rapidly process the supplies and equipment necessary to bring unit supply and equipment levels to their expected wartime requirements. In many cases, especially ammunition and subsistence, the whole-sale system rapidly builds stockpiles of theater operational stocks. No equivalent system is available to a deployed force to help expedite the return of equipment, supplies, and accumulated operational stocks. This materiel, unit and sustainment, has to be identified, inspected, classified, and for certain commodities, certified, before disposition instructions are requested. Once instructions are received, transportation must be coordinated and executed.

A reliable theater standard transportation system does not exist. The Department of Army Movements Management System has not kept pace with the highly mobile, joint theater operating environment. Today the redeployment process is "self-help" and without automated tools to manage the theater infrastructure activities and to redeploy unit and nonunit assets efficiently and expeditiously.

The Military Services have developed numerous tools and models to deploy unit forces. However, the Achilles' heel of redeployment lies in the ability to accurately and rapidly capture source data of equipment and materiel inventories. Consequently, the available models and automated systems are impracticable. Their focus is at the "gross" level of detail, as opposed to the specifics required in a redeployment operation. Furthermore, the tools are infrastructure oriented. They are used to deploy forces and are not available to most units for redeployment. Units must revert to manual, self-help methods of documentation and data exchange in a redeployment.

For example, the Military Services' family of transportation systems (Transportation Coordinator's Automated Information for Movement System, or TC-AIMS) operates with predefined databases, GBL movement documentation, and assured connectivity with Service and USTRANSCOM component systems. These automated deployment tools were not designed with the embedded capability to generate source data and do not allow the user to rapidly access common reference files to minimize the data entry effort. Units are required to document deployment information through a cumbersome, labor-intensive process involving paper work sheets and keyboard data entries. With the exception of limited capacity unit equipment bar-code applications, AIT has not been integrated into the TC-AIMS family of systems. TC-AIMS cannot produce bar codes with detail contents of internal loads of shipping containers and conveyances. TC-AIMS cannot accurately document detailed content data for retrograde sustainment cargo loaded in seavan containers.

The TC-AIMS family of systems will be eliminated when TC-AIMS II is developed and fielded. The new system will eliminate the shortfalls mentioned and will be used by all Military Services to provide command and control ITV data to GTN. TC-AIMS II will give warfighters more accurate, complete and timely deployment, redeployment, and sustainment data; allow the reading of cargo data directly through the use of bar codes or RF tags; provide standard base and unit level source data and deployment applications. The system will create a joint deployment system that provides a common hardware architecture suite that operations software applications for easy data retrieval, data exchange and connectivity to applicable external sources. TC-AIMS II will help units gain valuable deployment preparation time by eliminating incompatible deployment data in dissimilar systems.

During the redeployment process, it is not only the transportation system that experiences difficulties, but the entire supply chain is affected. Stocks that had been pushed to a theater to supplement peacetime-generated authorizations are suddenly "excess" to the deployed force requirements. Supplies sent to the theater as buildup now compete for management's attention with unit equipment and other materiel.

Final disposition arrangements must be made for all materiel. It will either be shipped with the unit's equipment, or segregated and processed for shipment to other locations. The lack of detailed, source data information causes further inefficiencies and slows the return of materiel to peacetime locations. Advanced visibility of nonunit materiel could be invaluable to the entire supply system. The ability to determine excess assets and their condition and provide disposition instructions before theater redeployment begins would greatly increase the effectiveness of the entire distribution system.

A theater commander must have materiel disposition instructions before making any distribution of materiel. Implied is the need for the theater commander to have precise inventories of equipment and supplies and their condition code. The theater commander must provide the CONUS or returning base or station timely and accurate information for the national provider to plan for the sale, disposal, reissuance, or redeployment of assets in-theater. As in the deployment process, it is imperative to establish fourth level-of-detail information on all aspects of redeployment operations. The ability to identify and maintain visibility of a redeployment includes being able to link a unit's deployment with the redeployment plan to ensure every unit and subelement is returned. The linkage of NSN and ULN level of detail ensures that all units and materiel are returned. Once the disposition has been determined, the priorities for redeployment can be planned, prioritized, and executed.

4.3.6.2 REQUIREMENTS FOR REDEPLOYMENT

The requirements listed in this subsection represent the needs of theater commanders as well as the supporting CINCs who must be prepared to receive the returning materiel, equipment, and personnel.

4.3.6.2.1 Theater Asset Database

Theater commanders and logistics and personnel staffs require an integrated database to provide users a consolidated view of all in-theater assets, including unit equipment, materiel, and personnel. This information must be the basis for requesting disposition instructions for residual sustainment materiel and equipment during redeployment.

4.3.6.2.2 Asset Disposition Instructions

Nonunit consumable supplies, materiel, and equipment that must be redeployed from a theater must be identified, disposition instructions issued when appropriate, and transportation coordinated and executed. Today that process is self-help, without the tools to perform the infrastructure-like activity necessary to return a CONUS-based force. Theater commanders, logistics staffs, and transportation units must have a method of passing requests for disposition instructions, identifying cargo for disposition, and linking disposition instruction responses to the applicable cargo.

4.3.6.2.3 Deployment and Redeployment ULN Linkage

Theater commanders, logistics and personnel staffs, and transportation units must have the ability to identify and maintain visibility of each unit's deployment plan and be able to link the unit's deployment plan with the redeployment plan to ensure every piece of unit equipment, accompanying supplies, and personnel are visible and accounted for during redeployment. The linkage of NSN to ULN (of both deployment and redeployment TPFDLs) to TCN levels of detail is essential in tracking unit redeployments.

4.3.6.2.4 Unit Asset Redeployment Visibility

Theater commanders, logistics staffs, transportation units, redeployment managers, and unit commanders being returned to home station require movement status visibility of all redeployment shipments, including those being temporarily stored in transient holding areas awaiting repair, customs, transportation, or receipt.

4.3.6.2.5 Redeployment Requisition Visibility

When the crisis is over and redeployment begins, numerous requisitions have been submitted that have not been received by the requesting activity. Theater logistics staffs and supply support activities require near-real-time visibility of the supply and transportation status of all outstanding requisitions and the enabling mechanisms that permit activities to cancel requisitions individually, or in mass based on selected parameters, and to divert or reconsign in-transit shipments. When requisitions have been canceled, diverted, or reconsigned, units submitting the requisition must be provided timely confirmation of the action.

4.3.6.2.6 Nonunit Assets

Theater commanders and their staffs, especially logistics activity commanders, are responsible and accountable for all nonunit assets in a theater. These users must have the capability to maintain visibility of nonunit assets (equipment, supplies, and materiel) from when they are identified for disposition until all disposition actions are completed.

4.3.6.2.7 War Reserves and Pre-Positioned Asset Reconstitution Visibility

Supported and supporting CINCs, theater logistics activity commanders, and Service/national IMMs require visibility of assets planned for return to WRS and designated pre-positioned storage areas. A requirement exists for visibility of equipment condition classifications before assets are returned to WRS or pre-positioned storage locations. These users must have near-real-time capability to monitor reconstitution of war reserve and pre-positioned assets.

4.3.6.2.8 Personnel Redeployment Tracking

The supported CINC J-1 and theater commanders require the capability to identify and monitor movement status of personnel and patients to be redeployed, including unit, nonunit, civilian augmentee, and support contractor personnel. The J-1 must have the analytical tools and scheduling information available to project unit departure and closure data. The CINC J-1, theater deployment managers, CONUS Service deployment managers, and home station installation commanders must also have near-real-time data to associate a specific individual or unit with actual departure, in-transit status, and arrival at final destination.

4.3.6.2.9 Blood Supplies

The theater surgeon, medical planners, and blood managers must have near-real-time visibility of blood shipments by type, quantity, current location, and if in-transit, shipment itinerary.

4.3.6.2.10 Medical Capability Assessments

Theater medical planners and logistics managers must have accurate and near-real-time information on theater medical unit requirements, available units in-theater and en route, medical skills available and en route, requisition/order and on-hand status of medical materiel, and medical unit operational status.

4.3.6.2.11 Medical Patient Tracking

As combat units move across a battlefield or over many miles of sea, theater medical managers as well as unit commanders must have rapid access to current patient status and location (including inter-Service patient treatment) and patient movement items. A capability is also needed to update medical patient records efficiently and automatically with changes in the actual location of assigned units.

4.3.6.2.12 Logistics Infrastructure

Theater logistics staffs and logistics support activity commanders must have total visibility of the distribution network capacity with sufficient detail to rapidly detect bottlenecks at storage areas, roadways, railways, airfields, water ports and

transition nodes. This visibility must be accompanied by the capability to direct diversions, reroute and apply additional lift or materiel-handling capability to any location. This requirement exists through all phases of the joint deployment process. The theater commander's staff must also have the ability to retain theater distribution data to update deliberate plans and develop future logistics support plans.

4.3.6.2.13 Theater Redeployment Statistical Database

During a contingency deployment, record keeping normally is a lower priority than the business of deploying and conducting operations. Time is insufficient to maintain data to support financial and administrative actions that will be settled after the contingency. Logistics and personnel lessons learned and benchmarking efforts must often rely on operational message traffic and human memory because factual, documented logistics and personnel statistics are not available. Theater commanders and their staffs need a theater logistics and personnel database of record to respond to claims, capture redeployment statistics, and be accessible for research, studies, and analysis after the contingency.

4.4 SYSTEM PERFORMANCE

This section contains functional performance standards. These requirements will be further refined and expanded as JTAV functional requirements are refined. The following functional characteristics are anticipated to be major drivers of automated system technical solutions that may be developed to meet JTAV functional requirements. Commercial, off-the-shelf information technology— rather than custom solutions—will be used to the maximum extent possible.

4.4.1 Communications

Source systems that provide JTAV capabilities must be supported with robust communications, electronic commerce and EDI transactions.

4.4.2 Information Timeliness

Except for the real-time visibility requirements of specific commodities identified in this FRD, near real-time processing and automatic asset identification must be the focus of both JTAV system and source data system upgrades. Query processing must be supported by on-line and batch modes.

4.4.3 Efficiency

The selected design must ensure comprehensive coverage and compliance, reduce maintenance costs, and avoid duplication of effort in networking data.

4.4.4 User Hardware

Users must have integrated workstations that provide a single point of entry to access JTAV information as well as the capacity and flexibility to support other user software and data storage requirements.

4.4.5 Functional System Interoperability

JTAV system development and DoD's future logistics and personnel systems must be designed as open systems architectures to ensure interoperability among hardware platforms and software applications. Standard data elements, naming conventions, and reference tables must be used in all JTAV-sponsored software development efforts to promote commonality of data across all functional boundaries.

4.4.6 Data Sharing

DoD Components must modify their logistics cultures from "unit and Service ownership" to "joint ownership with national visibility and access."

4.4.7 Classification

JTAV information will include unclassified and classified information. Security safeguards must be developed that permits authorized users access to both types of information when required. Initially, classified information and unclassified but sensitive information may include unit readiness data, joint deployment data, sensitive shipment itineraries, and sensitive critical ammunition inventories.

4.4.8 Deployability

JTAV information capabilities must be available to all theaters. JTAV supporting hardware must be easily maintained and transported. Hardware, software, and communications connectivity must be assured, reliable, and quick to set in place by forces deployed anywhere in the world.

5. Integrated Logistics Support

Integrated logistics support requirements will continue to evolve as the JTAV program matures. The initial requirements outlined in this section are stated from the functional user's view and are considered the minimum baseline requirements. Efforts should maximize the use of technology to reduce manpower, personnel and training requirements.

5.1 MAINTENANCE SUPPORT

Maintenance support must include commercial contract at all levels. Hardware acquisitions must assure that worldwide contract maintenance is available. The cost of contracting for maintenance, beyond new equipment manufacturers warrantees, is the responsibility of the user. System maintenance for JTAV will be required for end-user hardware, network hardware, communications support, and system software and operations maintenance. Requirements for each component are in the following subsections.

5.1.1 End-User Hardware

Government-provided maintenance support is acceptable where available but cannot be assured. Hardware (workstations) for end-users must be commercial off-the-shelf (COTS) components with commercial parts and maintenance available world-wide. Contingency deployments to bare base environments will require extra workstations to be available since "repair in place" maintenance support is not realistic. Adequate maintenance response time for end-user hardware is 3 hours to diagnose a problem and 24 hours to return a system to operable condition. When these parameters are not responsive, end-users should employ multiple hardware sets to achieve the level of redundancy required. Special ruggedized hardware and internal diagnostics capability, beyond that provided with the equipment operating system, are not required. Support costs for end-user maintenance must be provided by the using activity.

5.1.2 JTAV Network Hardware

Network and data-processing hardware maintenance must be available from commercial sources. With the risk of outages affecting hundreds of users, "float" systems must be available for immediate backup. Special attention must be given to the acquisition of these items to ensure that worldwide contract maintenance is available with technicians cleared to work on a classified JTAV configuration.

5.1.3 JTAV Communications

Maintenance of supporting JTAV communications, including any required leasing cost, will be the responsibility of the Defense Information Systems Network office to arrange and the respective CINC or Service components to fund. Commercial communications support is assumed for fixed, peacetime locations. Organic DoD tactical communications support is assumed for bare base, contingency deployment locations.

5.1.4 JTAV Software Maintenance

JTAV software must be controlled by formal configuration management procedures. Software maintenance support for the JTAV in-theater module will be centrally provided by the JTAV office. A functional configuration control board must be established with a representative from each CINC. Each supported CINC must identify an on-site system administrator that can perform limited system maintenance such as equipment movement and setup, boot-up operations, and backup and restore functions. A capability must be developed to allow new software versions to be broadcast and downloaded to JTAV network systems with minimal or no assistance by the site system administrator. Mail distribution of software versions for individual workstations is sufficient; however, the load procedures for installation by users must accommodate functional users with little or no computer system background.

5.2 TRAINING SUPPORT

Initial training for JTAV in-theater module end-users and on-site system administrators will be provided by the JTAV office. Follow-on training after the system has been placed in operation must be available through commercial contract or DoD internal training support. On-site training is preferred. Individual workstation software must be user friendly; built-in help screens must be available to allow functional users to teach themselves to use the system. Separate and easy-to-understand user manuals are required for end-users and site system administrators.

5.3 HELP DESK

There must be a help line or help desk available 24 hours per day, 7 days per week to provide worldwide support. Both technical and functional user assistance must be available. Assistance must be available by E-mail. The Internet is acceptable as a means to initiate a help request by E-mail. It is preferred that each supported CINC and Service have a primary help desk capability for the theater and CONUS customers, respectively, and that DoD arrange a central help desk as a backup to a CINC or Service capability.

5.4 TECHNICAL DATA

Technical data for system administrators to operate and maintain their network equipment and software must be furnished to each site during initial training. Updates to the technical data may be E-mailed or sent through the normal mail. Technical data for end-users, beyond that supplied by COTS hardware and software vendors, is not required.

5.5 FACILITIES

Facilities for JTAV equipment, both end-user and network, must be made available from existing government-controlled space. Acquisition of new facilities specifically dedicated for JTAV equipment must not be required. A special, atmospherically controlled environment must not be required by any of the equipment supporting JTAV. JTAV hardware must be able to operate in temperature and humidity conditions normally associated with office equipment (personal computers, printers, fax machines, and copiers).

Facilities for housing JTAV operational hardware must be provided by the user and respective CINC. Classified facility space will be needed for processing classified JTAV information. Specific facility requirements must be documented by site survey plans in advance of system fielding so that long lead-time requirements, such as additional power and communications, can be programmed and installed.

5.6 SUPPLY SUPPORT

Supply support items for JTAV will be the responsibility of the user. Both consumable supplies and hardware repair parts must be commercially available on a worldwide basis with an availability that accommodates the maintenance response requirements contained in Section 5.1.

5.7 MANPOWER AND PERSONNEL

JTAV hardware will require support personnel for operations and maintenance. The supported CINC or CONUS user must provide system administrator personnel where required. End-user and system administrator skills necessary for system operation must not require specific automated system training and experience. System administrator skills must be assumed to be in the area of functional logistics, not automation; thus all computer system training required must be provided during initial fielding. Personnel skills for hardware and software maintenance must be acquirable by commercial contract for performance of services anywhere in the world.

5.8 PACKAGING, HANDLING, STORAGE, AND TRANSPORTATION

Packaging, handling, storage, and transportation for initial and replacement hardware items must be commercially available for delivery worldwide. For bare base contingency deployments, the JTAV program manager must acquire suitable, reusable protective packaging to withstand the typical rough handling that may occur during force deployment operations. The specifications for this protective handling are assumed to be similar to other computer equipment hardware containers currently being deployed in support of contingency operations.

6. Infrastructure Support and Interoperability

6.1 COMMAND, CONTROL, COMMUNICATIONS, AND INTELLIGENCE

JTAV is a capability, not a functional automated system per se. It is intended to provide access to a wide variety of logistics data and is not a command and control system. However, software and hardware applications developed in conjunction with the JTAV capability will be offered as integration candidates to the Global Combat Support System (GCSS) architecture and are, therefore, being developed with GCSS-compatible standards.

6.1.1 Proposed Architecture for JTAV Capability

An overarching, to be worldwide architecture has not been chosen; however, it will be influenced by the GCSS architecture. A *functional* architectural framework to support JTAV is currently being developed.

6.1.2 Source System Interfaces

As GCSS and SHADE mature, major logistics systems will become integrated in a joint domain. While joint users in a GCSS environment may not need to process inter-Service transactions and update system databases, they must be able to query future GCSS logistics application systems and download data. In the interim, data sharing through system interfaces with legacy systems may be required. Potential major JTAV system interfaces include, but are not limited to, the following systems or categories of systems.

6.1.2.1 LOGISTICS INFORMATION PROCESSING SYSTEM

LIPS, which DAASC maintains, serves as DoD's central repository for information on the status of requisitions. The data in LIPS originate with requisitions and other supply-related transactions that flow among DoD units, ICPs, and sources of supply through the DAAS.

Consisting mostly of retail-to-wholesale orders, LIPS will need to be enhanced to support DoD's requirements for order tracking. The needed enhancements include improving its interface with GTN to facilitate the exchange of movement data and supporting new business practices, such as inter-Service lateral redistribution, intra-Service retail-to-retail orders outside normal requisitioning channels, and retail-to-prime vendor orders where the wholesale manager only receives after-the-fact notification that an order has been placed. Some of those improvements are already underway.

6.1.2.2 INVENTORY CONTROL POINT AUTOMATED INFORMATION SYSTEMS

ICP AISs — which refer primarily to ICP legacy systems and the emerging applications in the MMS, but also includes AISs used to manage specialized commodities, such as ammunition, fuel, and subsistence — would be the permanent data repository for information on all ICP-managed in-storage and in-process assets. These databases will be the source for a variety of assets and requirements information, including:

◆ on-hand wholesale and retail assets, including war reserve materiel, by location and condition code;

◆ wholesale assets due in from procurement and projected delivery dates;

◆ items in intermediate- and depot-level repair, with projected repair completion dates; and

◆ requisitioning objectives for secondary items and retention limits for every reporting supply activity.

Internal Service source systems would supply data to an ICP AIS. The source systems include those supporting IMMs, wholesale distribution depots, retail supply activities, intermediate- and depot-level maintenance activities, and DRMS. Those data would reflect all changes and updates to asset quantities, status, and conditions. Currency and accuracy of information are critical to the success of TAV.

All organizations requiring access to the TAV data in an ICP AIS would use a query-based system. The queries and responses would be designed to support a wide variety of planning requirements among headquarters activities, operational units, maintenance activities, and other users. IMMs would access the TAV data on-line if reducing procurement and repair quantities, and processing high-priority requisitions. They would not, however, redistribute the assets of deployed units. Those assets would be reported to the ICP AISs only to satisfy the stratification and inventory accounting system.

6.1.2.3 GLOBAL TRANSPORTATION NETWORK

The existing ITV functions in the GTN prototype are focused on visibility from POEs to PODs. The operational GTN is being developed as a command and control information system to aid in satisfying USTRANSCOM's mission of global transportation management. GTN consists of four modules that support current and future plans, ITV, and tracking of medical patients. The operational GTN being developed will include "factory to foxhole" in-transit visibility that starts at the shipper's point of origin and ends with the ultimate consignee's receipt. The ITV module will be DoD's comprehensive database of unit and nonunit shipment information (including military- and vendor-documented shipments), commercial carrier-generated shipment information, booking information, passenger reservations and manifests, personal property shipment information, and vessel and aircraft scheduling data.

6.1.2.4 JTAV IN-THEATER MODULE

One of the major barriers to TAV is the absence of visibility of the location and status of in-theater logistics assets. Theater CINCs and JTF commanders need logistics information in the JTAV in-theater module to enhance the planning for the deployment, reception, and onward movement of forces and materiel. The in-theater JTAV module also provides visibility needed for diversion of forces and materiel in-transit when required to meet changing contingency requirements and for managing in-theater assets to improve utilization, cross-leveling, and distribution. During redeployment of forces and retrograde of materiel, theater commanders and home station activities require the in-theater JTAV capability to dispose of assets and monitor redeployment progress.

Through the JTAV in-theater module, theater logisticians would be able to access in-transit, in-storage, and in-process information in LIPS, ICP AIS, and GTN. The JTAV in-theater module would merge this information with in-theater unit information and other in-theater-related logistics information for both inbound and outbound assets.

6.1.2.5 JOINT PERSONNEL ASSET VISIBILITY SYSTEM

Personnel asset visibility is a part of the larger DoD goal of TAV. Personnel and logistics information complement each other to provide a comprehensive assessment of force posture. As a result, JPAV is an integral part of JTAV and not a separate entity.

JPAV will provide the ability to identify, locate, and track

- units and individuals entering into, in, and redeploying from a JTF's area of responsibility, including active and reserve forces, U.S. government personnel, and contractor personnel;

- NEO personnel within a JTF's area of responsibility; and

- non-U.S. forces tasked to support a JTF.

JPAV will allow the JTF to compare personnel requirements to available personnel, occupational skills, and language skills and to analyze a variety of demographic data.

6.1.2.6 GLOBAL COMMAND AND CONTROL SYSTEM

JTAV automated system development efforts, such as an in-theater TAV repository, will be developed as an application fully compliant with the Defense Information Infrastructure (DII) common operating environment (COE). An interface must be developed that links the joint deployment and execution functionality in the GCCS with actual near-real-time JTAV visibility during the predeployment, deployment, employment, and redeployment phases of a contingency crisis operation or MOOTW.

6.2 STANDARDIZATION, INTEROPERABILITY, AND COMMONALITY

Automated system and communications applications selected to satisfy the needs of this FRD will be DII COE compliant, including Open Systems Interconnection, model layers as defined by the International Standards Organization, and used in Government Open Systems Interconnection Protocol. However, the DII COE-compliant applications selected or developed may require interfaces to older, legacy and commercial applications that will not be DII COE compliant.

Identifying attributes used as access keys must be global among interfacing systems. Cross-references associated with the relationship of item identification numbers (such as national stock number, General Services Administration and commercial catalog number, commercial order numbers, universal product code, and national drug code) must be transparent to the customer as each database interface is implemented.

6.3 SYSTEM SECURITY

The JTAV in-theater module will require interfaces with classified systems and may receive and store classified data. JTAV must comply with applicable

minimum mandatory security requirements defined in DoD Directive 5200.28, *Security Requirements for Automated Information Systems*. The JTAV capability must be certified and accredited according to the requirements of DoD Directive 5200.28. JTAV must also comply with the security requirements specified in the Technical Architecture for Information Management and the DII COE runtime specification. Security requirements imposed by the JTAV operational environment must also be met.

The JTAV security policy must be established and considered throughout the entire life cycle of the JTAV capability. The safeguarding of JTAV information and AIS resources must be accomplished through the continuous employment of a cohesive set of information security (INFOSEC) safeguards, including, but not limited to, computer security (COMPUSEC); physical, administrative, and procedural security; and communications and emanations security, as appropriate. The mix of selected safeguards must provide integrity, confidentiality, and protection against denial of service.

Where required, JTAV must incorporate trusted products evaluated by the National Security Agency using the *DoD Trusted Computer Systems Evaluation Criteria* (DoD 5200.28-STD or "Orange Book") and secure components produced by the Multilevel Information System Security Initiative or accredited in an operational environment.

7. Force Structure

Functional and technical solutions to DoD's JTAV problems are not expected to require significant force structure additions or changes. However, requirements must be determined for system administration personnel to manage JTAV data-bases, communications, and data processing equipment in-theater as well as CONUS. The number, type (contractor or government employee), and operating location of these personnel cannot be determined until more is known about the specific solutions to the requirements contained in this FRD.

8. Schedule Considerations

There are no schedule requirements that mandate specific capabilities must be in place in accordance with a defined schedule. The JTAV capability will be developed incrementally. More exact schedules will be included in project management documentation for specific increments of the JTAV program.

Glossary

AIS	automated information system
AIT	automatic identification technology
AMSS	Ammunition Management Standard System
ANSI	American National Standards Institute
APOD	aerial port of debarkation
APOE	aerial port of embarkation
CCP	container consolidation point
CIN	cargo increment number
CINC	commander-in-chief
CLS	contractor logistics support
COA	course of action
COE	common operating environment
CONUS	continental United States
COTS	commercial off-the-shelf
DAAS	Defense Automatic Addressing System
DAASC	Defense Automatic Addressing System Center
DII	Defense Information Infrastructure
DLA	Defense Logistics Agency
DMLSS	Defense Medical Logistics Standard Support
DoD	Department of Defense
DODIC	DoD identification code
DRMO	Defense Reutilization and Marketing Office
DRMS	Defense Reutilization and Marketing Service
EDI	electronic data interchange
FAS	Fuels Automated System
FOB	free-on-board
FRD	functional requirements document
GBL	government bill of lading
GCCS	Global Command and Control System

GCSS	Global Combat Support System
GTN	Global Transportation Network
HNS	host nation support
ICP	inventory control point
IM	item manager
IMM	integrated materiel manager
INFOSEC	information security
IRIS	Interrogation Requirements Information System
ITV	in-transit visibility
JPAV	Joint Personnel Asset Visibility
JPEC	Joint Planning and Execution Community
JTAV	Joint Total Asset Visibility
JTB	Joint Transportation Board
JTF	joint task force
LIPS	Logistics Information Processing System
MEF	Marine expeditionary force
MILSTAMP	Military Standard Transportation and Movement Procedures
MIL-STD	military-standard
MILSTRIP	Military Standard Requisitioning and Issue Procedures
MMS	Materiel Management System
MOOTW	military operations other than war
MPV	Medical Prime Vendor
NC	noncombatant
NDC	national drug code
NEO	non-combatant evacuation operations
NSN	national stock number
OCONUS	outside the continental United States
ORD	operational requirements document
OSD	Office of the Secretary of Defense
PICA	primary inventory control activity
PIN	personnel increment number

POD	port of debarkation
POE	port of embarkation
POL	petroleum, oils, and lubricants
RO	requisitioning objective
SHADE	shared data environment
SICA	secondary inventory control activity
SPVI	Subsistence Prime Vendor Initiative
SQL	structured query language
TAV	total asset visibility
TC-AIMS	Transportation Coordinator's Automated Information for Movement System
TCN	transportation control number
TPFDL	time-phased force and deployment list
TTP	trailer transfer point
ULN	unit line number
UPC	universal product code
UPN	universal product number
USTRANSCOM	United States Transportation Command
VCIN	vendor catalog item number
VMSIR	Virtual Master Stock Item Record
WPOD	water port of debarkation
WRS	war reserve stock